

North Bank Habitat Management Area/ACEC

Record of Decision
Habitat Management Plan
and
Monitoring Plan



June 2001

U.S. Department of the Interior
Bureau of Land Management

In Cooperation with:
U.S. Fish and Wildlife Service
Oregon Dept. of Fish and Wildlife

Roseburg District Office
777 NW Garden Valley Blvd
Roseburg, Oregon 97470



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North Bank Habitat Management Area and Area of Critical Environmental Concern

Record of Decision Habitat Management Plan And Monitoring Plan

Lead Agency: U.S. Department of the Interior
Roseburg District Office
Bureau of Land Management

Cooperating Agencies: U.S. Department of the Interior
Fish and Wildlife Service

Oregon Department of Fish and Wildlife

Prepared by
Roseburg District Office
June 2001

Dear Reader:

We are very pleased to present the Record of Decision and Habitat Management Plan for the North Bank Habitat Management Area - Area of Critical Environmental Concern. The following materials are organized in three main sections:

1. **The Record of Decision (ROD).** The ROD officially documents what decisions have been made and the general rationale. It describes the alternatives considered through the Environmental Impact Statement process. It also discusses the environmentally preferred alternative.
2. **The North Bank Habitat Management Area - Area of Critical Environmental Concern Habitat Management Plan (HMP).** The HMP documents the actual management plan for the NBHMA/ACEC. The HMP will be the primary reference document for future management activity in the NBHMA/ACEC.
3. **The North Bank Habitat Management Area - Area of Critical Environmental Concern Monitoring Plan.** The Monitoring Plan documents the primary monitoring activity that will occur on the NBHMA/ACEC. The monitoring plan has been developed to provide guidance on how monitoring should be conducted. However, it also reflects the dynamic nature of management of the North Bank area. The focus has been on the application of monitoring that will provide efficient, cost-effective information to ensure that management activities are contributing to meeting the objectives established in the HMP. Monitoring is also designed to adjust over time as management techniques either prove to be successful or are adjusted to be successful and lower monitoring intensity is needed.

This plan has been formulated to be very adaptive. BLM will rely heavily on the evaluation of monitoring information over time to ensure that conditions on the ground are moving in the desired direction. This means that small “course corrections” can be expected when agency interpretations of the monitoring information indicate the need. By the same token, many of the systems in the NBHMA/ACEC are expected to take decades or longer to respond to management. An example is the healing of the deeply incised stream channels. These simply require time and consistent management to recover. It is also expected that there will be “episodic” set-backs. There can be flood events that appear to erase earlier gains in riparian habitat recovery. When these occur, they do not necessarily represent a failure of the plan or its implementation, just a natural event that is expected. Likewise, flooding can be an important and necessary process in stream channel evolution through channel widening and flood plain development. This fits the context of adaptive management within the framework of the HMP.

The NBHMA/ACEC will be managed as secure habitat for the Columbian white-tailed deer. That is a primary focus for the area. However, the NBHMA/ACEC is not simply a preserve. The area will be managed under concepts of multiple use. Other resource values have a large role in the management of the area. Protection and expansion of habitat for listed plant species are important aspects of the plan. Restoration and maintenance of aquatic habitat throughout the NBHMA are also key aspects of the plan. However, the area is also for the use and enjoyment of the public. Recreational opportunities abound in the NBHMA/ACEC and are supported by the plan. Perhaps some of the least publicized opportunities presented by the NBHMA/ACEC include the availability of an area for research. The BLM expects to continue to support a wide variety of research conducted by various academic institutions. We also think there are untapped opportunities for environmental education programs on the area that can be developed cooperatively with local school systems. We also anticipate a vast array of volunteer projects being available for hands-on work on the NBHMA over time.

In short, we are excited to be approaching the end of a long analytical process. The final product has been substantially improved through the public involvement in this project and the cooperation that has been provided by both the US Fish and Wildlife Service and the Oregon Department of Fish and Wildlife. We are eager to get under way with the on-the-ground work. Thank you for your interest and involvement.

Record of Decision

Introduction	9
Alternatives Considered and Rationale for Decision	9
Decision	10
Rationale	11
The Environmentally Preferable Alternative	11
Valid Existing Rights	12
Implementation	12
Mitigation and Monitoring	12
Public Involvement	13
Livestock Grazing	13
Commercial Logging	14
Roads	14
Riparian Reserves	14
Pesticides/ Herbicides/Fertilizer	15
Prescribed Fire	15
Survey and Manage	15
Appeal Procedures	16

Record of Decision

The North Bank Habitat Management Area (NBHMA) / Area of Critical Environmental Concern (ACEC)

Prepared by Swiftwater Resource Area of the Roseburg District of the Bureau of Land Management

Introduction

This Record of Decision adopts a modified version of Alternative C of the Final EIS (FEIS) as represented in the attached Habitat Management Plan (HMP). This decision is consistent with, and further implements the Roseburg District Resource Management Plan (RMP) adopted in June 1995. The implementation of this plan provides for the protection and enhancement of habitat for the Columbian white-tailed deer (CWTD), a federally listed (endangered) species as well as other special status plants and wildlife that are present. This plan also accommodates other uses such as recreation that are compatible with the management of CWTD, other wildlife species and plants. Timber production would be emphasized on 342 acres (5%) of the management area. This area is part of the Matrix land use allocation and is not a part of the ACEC (Area of Critical Environmental Concern). Timber management and harvest would be compatible with management of CWTD.

The FEIS was developed from the draft EIS that was released in December 1999. The FEIS reflects changes as the result of comments received from the public, other governmental agencies, and review by BLM interdisciplinary team members. The attached HMP and this Record of Decision will be the basis for management of the 6,581 acre North Bank Habitat Management Area.

This plan has been produced with the participation and cooperation of the U.S. Fish and Wildlife Service (USFWS) and the Oregon Department of Fish and Wildlife (ODFW). Other public agencies have been contacted relative to management of the area including the National Marine Fisheries Service (NMFS), the Glide Rural Fire District and Douglas County government. This plan for management of the NBHMA has undergone formal consultation with the USFWS. A Biological Opinion (BO) was issued by USFWS on May 31, 2001 which concluded that "... the proposed management actions on the NBHMA are not likely to jeopardize the continued existence of the rough popcorn flower or the Columbian white-tailed deer..." Informal consultation was accomplished with the National Marine Fisheries Service (NMFS) and a Letter of Concurrence was received on May, 17, 2001 which concluded: "Based on information provided by the BLM and ODFW, the NMFS concurs with the BLM determination that the proposed project is not likely to adversely affect OC [Oregon Coast] coho salmon or OC steelhead..."

Implementation of this ROD/HMP would provide 6,544 acres of secure habitat for CWTD and would substantially support the U.S. Fish and Wildlife Service decision to delist the CWTD (US F&WS Proposed Rule to Delist the Columbian White-Tailed Deer, Federal Register Notice 64FR25263, 5/11/99).

Alternatives Considered and Rationale for Decision

Three alternatives were considered and analyzed in the FEIS and are summarized below. The FEIS, Chapter Two, describes the alternatives in detail.

Alternative A (No Action): This alternative would continue the present management as described in the Environmental Assessment for the Proposed Dunning Ranch Exchange (Exchange EA). Under Alternative A, management for CWTD would require NEPA documentation to implement grazing, prescribed fire, and other management specified under the Exchange EA. Recreation would not be developed beyond current levels.

Alternative B: This alternative represents a more passive and less intrusive approach to meeting the purpose and need. Active management would include mowing and heavy reliance on the use of prescribed fire and reseeded to maintain and improve habitat. The use of fertilizer or establishment of forage plots would not be used to enhance forage quantity or quality. Riparian and hydrologic conditions would be improved through road maintenance, road decommissioning and stream rehabilitation. The restoration of stream channels and hydrologic conditions would largely rely on natural recovery processes. Active intervention would include tree planting and the use of heavy equipment from existing roads. Artificial water sources, spring development and creation of additional wetlands would not take place. Road management would focus on maintenance necessary to gain access to implement a management action or to repair road segments that are degrading water quality. Nine miles of existing road would be decommissioned in order to reduce hydrologic impacts. Recreational use would occur within the constraints of existing conditions. Existing facilities would be maintained and no new facilities would be developed.

Alternative C (Preferred Alternative): This alternative represents an active approach to management in meeting the purpose and need. Under Alternative C, active management to maintain or enhance habitat would include the use of prescribed fire, grazing, fertilization, seeding, planting forage plots and mowing. Livestock grazing would be used to maintain and improve CWTD habitat. Timber would be managed on 342 acres but due to the young age of the stands, timber harvest would not occur for at least 30 years. Riparian and stream restoration would include the use of heavy equipment to accomplish in-stream and stream bank work. The goal of accelerating the time for streams to reach a properly functioning condition would be accomplished by preserving stream reaches that are properly functioning, stabilizing stream banks that are actively eroding, rehabilitating downcut banks and aggrading stream bottoms, and planting vegetation to stabilize stream banks. In some cases, deeply incised stream channels would be allowed to widen and establish a new flood plain naturally. Water accessibility for wildlife would be enhanced through artificial water sources, spring development and development of wetlands. Recreation use would be accommodated through the development of new facilities and replacing the main barn with a day-use pavilion. One mile of additional trail could be constructed to improve access and disperse public use and avoid sensitive areas. Three Watchable Wildlife sites would be developed.

Decision

The decision is to accept Alternative C with the following modifications:

1. Approximately nine miles of road (identified for decommissioning under Alternative B) will be decommissioned as part of this decision in order to reduce hydrologic impacts due to roads. Decommissioning (Western Oregon Transportation Management Plan 1996) will consist of:
 - closing the road on a long-term basis, but may be used again in the future;
 - preparing the road to avoid future maintenance needs;
 - leave the road in an “erosion-resistant” condition by establishing cross-drains, removing fills in stream channels and potentially unstable areas;
 - treating exposed soil to reduce sedimentation;
 - closing road with a device similar to an earthen barrier (tank trap) or equivalent.Decommissioned roads may be reopened temporarily to accommodate fire management (prescribed fire and wildfire) and restoration activities. Approximately 1.5 miles of decommissioned road, along the southeast boundary of the NBHMA, will be used as

fire access and fire control lines when needed for prescribed burning or fire fighting activities.

2. Restoration of streams will encompass a combination of the approaches of Alternatives B and C. All of the management actions provided for under Alternative C will remain available in the Habitat Management Plan (HMP). However, reliance on heavy equipment and engineering will be initially focused on control of headcut erosion and addition of coarse woody debris (CWD) within streams. Stream channel adjustments and flood plain development will rely more heavily on natural processes. Over time, the use of machinery, as provided for in Alternative C, may be done on a case-by-case basis.
3. Grazing will be used as a vegetation management tool. The BLM will employ an adaptive approach in which various grazing strategies (techniques) can be implemented on a small scale basis to determine the most effective long-term grazing plan. This adaptive approach will ensure that vegetation management strategy:
 - Contributes to the vegetation management objectives.
 - Conforms with Aquatic Conservation Strategy (ACS) objectives.
 - Is integrated with the prescribed fire program.
 - Is cost effective.

Rationale

The **No Action** alternative was not adopted because it would not meet the purpose and need as outlined in the FEIS (pg. 3) to promote recovery of the CWTD through active management to improve the physical condition and increase survival of the deer, as well as improving water quality and restoring habitat for listed fish stocks. Project-by-project planning and NEPA documentation would not represent efficient management of the area.

Although Alternative B would meet much of the purpose and need, it was not adopted because it would not allow the use of additional tools such as fertilization, forage plots and grazing. These practices accelerate improvement of forage quality for the CWTD. Furthermore, this alternative would not allow development of a needed water access point at Doc's Landing for recreation and fire fighting.

The Preferred Alternative (Alternative C) meets the purpose and need and provides a broader range of management options to accomplish the goals of the EIS that would not be available under Alternative B.

The Environmentally Preferable Alternative

Environmental preferability is judged using the criteria in the National Environmental Policy Act of 1969 (NEPA), which are guided by the Council on Environmental Quality (CEQ). The CEQ has stated that "The environmentally preferable alternative is the alternative(s) that will promote the national environmental policy as expressed in NEPA's Section 101. Generally this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources." (Council on Environmental Quality, "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations (40 CFR 1500-1598), Federal Register Vol. 46, No. 55, 18026-18038, March 23, 1981: Question 6a.).

NEPA's Section 101 establishes the following goals:

- Fulfills the responsibility of this generation as trustee of the environment for succeeding generations (NEPA §101(b)(1)),

- Assures for all Americans productive and aesthetically and culturally pleasing surroundings (NEPA §101(b)(2)),
- Attains the widest range of beneficial uses of the environment without degradation or other undesirable and unintended consequences (NEPA §101(b)(3)),
- Preserves important natural aspects of our national heritage and maintains an environment which supports diversity and variety of individual choice (NEPA §101(b)(4)),
- Achieves a balance between population and resource use, which permits high standards of living and a wide sharing of life's amenities (NEPA §101(b)(5)), and
- Enhances the quality of renewable resources and approaches the maximum attainable recycling of depletable resources (NEPA §101(b)(6)).

The Action Alternatives (Alternatives B and C) are the environmentally preferred alternatives because they would result in the least damage to the biological and physical environment. They would best improve habitat for the CWTD as well as arrest on-going mass wasting into the stream systems that impacts water quality compared to the No Action alternative.

Valid Existing Rights

This plan will not repeal valid existing rights on public lands. Valid existing rights are those claims or rights to public lands that take precedence over the actions contained in this plan. Valid existing rights may be held by other federal agencies, or by private individuals or companies. Valid existing rights may pertain to mining claims, oil and gas leases, rights-of-way and water rights. There are no mining claims or oil and gas leases on the NBHMA. A right-of-way agreement with Lone Rock Timber Company (R-767) encumbers a portion of the north part of the NBHMA. Rights-of-ways exists for power transmission and communication lines and road easements.

Implementation

Decisions in this plan will be implemented over a period of years. The rate of implementation is tied to the BLM's budgeting process and staff limitations. General priorities for overall management will be developed through long-term budgeting processes and consultation with other agencies as guided by this ROD and HMP. Specific priorities will be reviewed annually to help develop the work plan commitments for the coming year. The HMP describes the various projects that could be implemented under this plan. These projects would be implemented on a project-by-project (or grouping of similar projects) basis. Any action that is not in conformance with this plan will require further NEPA analysis and would receive formal public review. A grazing and burning plan will be developed that will be consistent with this ROD, HMP and the FEIS.

Mitigation and Monitoring

The "protective measures" identified in the FEIS (pp. 10-13) and "terms and conditions" in the Biological Opinion (pg. 24), will be implemented to avoid or mitigate adverse impacts. These measures will be strictly enforced throughout implementation.

Monitoring and evaluations will be utilized to ensure that decisions and priorities conveyed by the plan are being implemented, that progress toward identified resource objectives is

occurring, and that mitigating measures are effective, and that the plan is maintained and consistent with the ongoing development of national and state guidance. The Monitoring Plan is included after the HMP.

Public Involvement

A mailing list was assembled consisting of those individuals and organizations who requested and/or were sent a copy of the DEIS. Each person and organization who attended a NBHMA open house or submitted substantive written comments during the public comment period were also included on the mailing list. The sixty-day public comment period for the DEIS was from December 28, 1999, through February 28, 2000, and subsequently extended an additional 15 days until March 13, 2000. The Roseburg District received 28 letters with 124 specific comments from individuals, government officials, and organizations. Some individuals and organizations sent more than one letter. A list of individuals who commented may be found in the FEIS, Chapter 5. A thirty-day public review period was established on September 22, 2000, and subsequently extended an additional fifteen days until November 6, 2000. Although public comments were not solicited, comments were received from two individuals and considered in the ROD.

Public involvement in the planning process for the NBHMA/ACEC has been extensive. It has significantly influenced the development of the ROD, the HMP and the Monitoring Plan. Public comments have demonstrated widespread support for the restoration and improvement of Columbian white-tailed deer habitat. There also has been wide support for restoration of riparian and aquatic systems within the NBHMA/ACEC. Along with support for these restoration activities, there is a broad base of support for uses of the North Bank area that are compatible with protection and enhancement of CWTD habitat and other Special Status Species. Such uses include a broad spectrum of recreational activities such as hiking, mountain biking and horse back riding and public access to the North Umpqua River.

However, along with this support, concerns have also been raised about proposed management activities in the NBHMA/ACEC. These concerns include: the potential effects of the use of livestock to help meet some vegetation management objectives; the use of various chemical herbicides/pesticides and fertilizers; the potential for some logging activities within the NBHMA; activities proposed within the riparian reserves and conformance with the Aquatic Conservation Strategy in the Roseburg Resource Management Plan and the Northwest Forest Plan; and how survey and manage species will be addressed under the NBHMA/ACEC. Each of these concerns is addressed in more detail below. Each concern is described, the consideration given to it in arriving at a final decision is presented, and any adjustments that were made through the ROD/HMP or Monitoring Plan are described.

Livestock Grazing

Throughout the process of the development of the NBHMA there has been concern over the use of cattle grazing as a tool to achieve vegetation management objectives.

Consideration Given BLM recognizes that there are controversies associated with grazing. Improper grazing management can result in damage to riparian and upland habitats. Improper grazing management can also introduce or spread noxious weeds or other undesirable plants (including invasive weeds). We have considered these potential effects. We also note that no other potentially viable alternatives for meeting the vegetation objectives have been presented through the public input on the plan. The only other suggestion has been to apply prescribed fire on a higher frequency. This was analyzed in the FEIS and the effects noted.

Adjustments Made In cooperation with the USFWS and ODF&W, BLM proposes to take a very cautious approach to the use of grazing as a vegetation management tool. The FEIS has

analyzed the general effects of grazing and this analysis will be relied upon to set overall parameters. However, BLM proposes to start out with small numbers of cattle in controlled situations and use adaptive management to develop a more long-term vegetation management strategy.

Commercial Logging

The FEIS provides for the possibility that small-scale wood products operations could take place on the NBHMA/ACEC. Such operations could involve a contractor doing some kind of work in support of the HMP (such as thinning certain woodlands types for habitat purposes). As payment for the thinning services, the contractor could utilize a portion of the timber thinned for commercial purposes. Concern has been expressed that this would lead to inappropriate thinning designs, etc.

Consideration Given In considering this concern, BLM has reviewed the over-riding purpose and need for the various actions that could take place on the NBHMA, the Roseburg RMP and the Northwest Forest Plan. It is the Bureau's position that such small-scale commercial operations are compatible with the dual purpose of the NFP and the Roseburg RMP to protect sensitive resource values and provide sustainable resource production. Further, our consideration of the concern relies on the fact that all such activities will be guided and controlled by the management objectives for the NBHMA.

Adjustments Made No adjustment has been made in the ROD or HMP.

Roads

Concern has been expressed about the amount of roads needed for management of the NBHMA, their interruption of hydrological function and their contribution to water quality problems.

Consideration Given BLM has given these concerns a great deal of consideration in arriving at the ROD. A balance between need for roads to meet administrative needs (primarily to safely conduct prescribed burning) and decreased adverse effects on hydrology and water quality has been a major consideration. While the analysis in the FEIS demonstrates that the overwhelming amount of sediment being delivered to the aquatic system in the NBHMA is from the banks of deeply incised channels and headcutting, there is also some sediment from the existing road system.

Adjustments Made The ROD adopts Alternative B for the road network within the NBHMA. Under Alternative B nine miles of roads would be decommissioned. This decision is based on the ability of BLM to perform needed administrative functions and management actions, including prescribed fire without these road segments.

Riparian Reserves

The most prevalent concern expressed regarding riparian reserves has to do with the potential adverse effects of livestock grazing on riparian reserves and limiting attainment of objectives under the NFP Aquatic Conservation Strategy (ACS).

Consideration Given The NBHMA HMP will conform with all three grazing management standards established in the NFP ROD (GM - 1 - 3, pp. C-33 - 34, Northwest Forest Plan ROD). GM - 1 provides for livestock grazing within the riparian reserves so long as it does not retard or prevent attainment of ACS objectives. This is the intent of grazing management proposed for the NBHMA. This is also part of the rationale for taking a very cautious approach as outlined above under grazing. GM - 2 provides that new livestock handling facilities be located outside the riparian reserves to ensure that ACS objectives are met. Additionally, GM - 2 provides that existing livestock-handling facilities that are within riparian reserves meet the ACS objectives or be moved outside the riparian reserves. Extending the use of existing livestock-handling

facilities (such as at the main feeder barn) is certainly a possibility. However, all such uses will ensure that ACS objectives are met.

Adjustments Made As noted above, BLM proposes to start out with small numbers of cattle in controlled situations and use adaptive management to develop a more long-term vegetation management strategy.

Pesticides/Herbicides/Fertilizer

There is concern about the application of pesticides, herbicides and fertilizers and their potential for adverse effects on water quality and fish and wildlife species.

Consideration Given BLM is cautious with the use of pesticides. The only pesticide use planned on NBHMA is the use of herbicides on noxious weeds (those plants defined by law as “injurious to public health, agriculture, recreation, wildlife or public or private property”). Project design features will be used to minimize or eliminate unintended effects of herbicide use on water quality, wildlife and non-target species. All feasible weed control alternatives will be considered prior to weed control treatments. Manual, mechanical and biological control techniques will be emphasized. High priority sites may be treated with herbicide alone or in conjunction with other control techniques.

Similarly, the application of fertilizer will be a controlled activity. Fertilizers will only be applied where soils have been demonstrated to be nutrient deficient. Less than 10 percent of the area would be treated in any one year. Buffer zones around streams and wetlands would be enforced.

In both cases, monitoring will be applied and utilized to adjust management activity as needed.

Adjustments Made No adjustment has been made in the ROD/HMP. However, additional detail is presented in the Monitoring Plan.

Prescribed Fire

Concern has been expressed that prescribed fire, especially in very steep locations, could lead to depletion of the soil productivity.

Consideration Given This concern was addressed in the FEIS under soil productivity. It is given further attention in the monitoring plan.

Adjustments Made The monitoring plan includes a section that presents monitoring and other actions that address the concerns of potential soil productivity loss from prescribed fire.

Survey and Manage

A concern was raised in regard to how survey and manage (S&M) species would be addressed in the NBHMA.

Consideration Given This concern has been considered from a number of perspectives. S&M guidance provides direction for the management of habitat for *late-successional and old-growth forest dependent species* (emphasis added). The NBHMA has been managed as a ranch for nearly a century and a half. The vast majority of the area has long since been converted to grassland or savannah and does not present characteristics of either late-successional or old-growth forest. Additionally, the property was heavily logged in the late 1950's or early 1960's. This removed timber which may have met the criteria for late-successional or old growth. Established survey and manage protocols do not require surveys in these habitat types. Where suitable survey and manage habitat occurs, survey and manage protocols will

be implemented. Management of known sites at all locations in the NBHMA will be managed in compliance with all applicable guidance and management recommendations.

Adjustments Made No adjustment has been made through the ROD.

Appeal Procedures

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4. If an appeal is taken, your notice of appeal must be filed in this office within 30 days after the legal notice announcing the availability of this Decision Record appears in *The News Review*. The appellant has the burden of showing that the decision appealed from is in error.


It is possible to request a stay of effectiveness of this decision during the time your appeal is being reviewed by the Board. You must file a petition pursuant to regulation 43 CFR 4.21 (58 FR 4939, January 19, 1993) accompanying your notice of appeal. The stay petition is required to show sufficient justification based on these standards:

- 1) The relative harm to the parties if the stay is granted or denied,
- 2) The likelihood of the appellant's success on the merits,
- 3) The likelihood of immediate and irreparable harm if the stay is not granted and,
- 4) Whether the public interest favors granting the stay.

A copy of your notice of appeal and of any statement of reasons, written arguments, or briefs, must also be served upon the Regional Solicitor, Pacific Northwest Region, U. S. Department of the Interior, 500 NE Multnomah Street, Suite 607, Portland, Oregon 97232, within the same time frame.

For further information, contact Jay K. Carlson, Field Manager, Swiftwater Field Office, Roseburg District, Bureau of Land Management, 777 NW Garden Valley Blvd; Roseburg, Oregon 97470, telephone (541) 440-4930.

APPROVAL

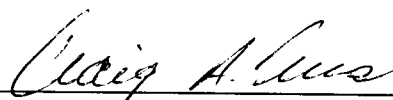


Jay K. Carlson, Field Manager
Swiftwater Field Office

6/5/01

Date

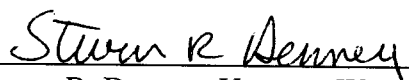
CONCURRENCES



Craig A. Tuss, Field Office Supervisor
Roseburg Field Office, USF&WS

6/7/01

Date



Steven R. Denney, Umpqua Watershed District Manager
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6/7/01

Date

Habitat Management Plan

TABLE OF CONTENTS

INTRODUCTION	23
Reason for Preparation	23
Ecosystem Description	23
Relevant Constraints	24
GOALS	25
ISSUES	25
HABITAT MANAGEMENT PLAN OBJECTIVES AND PLANNED ACTIONS	25
Issue 1: Columbian white-tailed deer and Special Status Species	25
Objective #1. <i>Increase availability, palatability and nutritional level of CWTD forage and browse.</i>	25
Objective #2. <i>Manage habitats to retain mature oak, shrub and herbaceous component. Maintain or improve early-seral stage of the hardwood/conifer type and convert marginal habitat into earlier seral stages. Manage residual conifer stands for mature tree attributes.</i>	29
Objective #3. <i>Control noxious weeds in the NBHMA.</i>	30
Objective #4. <i>Protect, manage and conserve existing populations of special status plants.</i>	31
Issue 2. Recreational Use and Facility Development	31
Objective #5. <i>Provide a range of recreational opportunities compatible with the management of CWTD and other Special Status species.</i>	31
Issue 3. Water Quality/Quantity	33
Objective #6. <i>Reduce and control mass wasting and sedimentation into streams.</i>	33
Objective #7. <i>Restore and maintain water quality for beneficial uses.</i>	34
Objective #8. <i>Increase base flows of streams to provide perennial flow into the summer.</i>	34
Issue 4: Riparian/Wetland Habitat	34
Objective #9. <i>Rehabilitate and protect fish stocks at risk and their habitat through a reduction of sedimentation and peak flows associated with roads and instream work to repair degraded stream reaches.</i>	35
Objective #10. <i>Provide fish passage for stream crossings.</i>	35
Objective #11. <i>Increase water availability in the uplands for CWTD and Special Status Species.</i>	36
Objective # 12. <i>Enhance and maintain biological diversity and ecosystem health to contribute to healthy wildlife populations (RMP, p. 37).</i>	36
MONITORING	37
RESEARCH OPPORTUNITIES ON THE NBHMA	37
COST ESTIMATES AND IMPLEMENTATION SCHEDULE	38
Burning	38
Grazing	39
Fencing	39
Fertilization	39
Forage Plots.....	39
Thinning	39

Noxious Weed Inventory, Monitoring, and Control	39
Special Status Plant Assessments	39
Special Status Plant Enhancement and Establishment	40
Recreation Facility Cost Estimates	40
Visual Resources Cost Estimates	40
Environmental Education	41
Water Impoundments	41
Seeps & Springs	42
Water catchment, storage type guzzlers	42
Project Maintenance	42
Rehabilitation of stream segments	43
Rehabilitation of head cuts	43
Aggrade stream channels	43
Cultural Resources	43
Studies	44
 PLAN EVALUATION	 44

NBHMA Habitat Management Plan (HMP)

INTRODUCTION

The NBHMA Environmental Impact Statement analyzes potential impacts that could occur with the implementation of the various alternatives considered. Alternative C is the Agency's Proposed Action. This HMP is based on the implementation of that alternative as modified by the ROD.

Reason for Preparation

The 6,581-acre North Bank Habitat Management Area (NBHMA), formerly the Dunning Ranch, was acquired by the Bureau of Land Management (BLM) in 1994 through a land exchange to acquire secure habitat for the federally endangered Columbian white-tailed deer (*Odocoileus virginianus leucurus*). Managing the NBHMA as secure habitat is intended to promote recovery of the CWTD. The BLM has responsibility, under the Endangered Species Act (section 7(a)(1)), to promote recovery of endangered species. The BLM needs to manage the NBHMA in a manner which will conserve, recover, and protect the existence of Columbian white-tailed deer. Species are recovered when they no longer need the protection of the Endangered Species Act (ESA section 4(b)(3)(B)). Due to the area's value as habitat for Columbian white-tailed deer (CWTD), Shrubby Rock Cress (*Arabis koehleri* var. *koehleri*), and False Caraway (*Perideridia erythorhiza*), 6,221 acres were designated as an Area of Critical Environmental Concern (ACEC) (Roseburg District Resources Management Plan [RMP], page 89) with the remaining acres to be managed for timber production (Decision Record, Exchange EA, 1993, page V). The NBHMA is located northeast of Roseburg, Oregon.

In addition to management as secure habitat for the CWTD, the acquisition of the NBHMA has provided other management opportunities. A level of recreation could be accommodated that would be compatible with the primary management goal of maintaining secure habitat for the CWTD. Many of the streams have reaches that are in a highly degraded condition with opportunities for restoration.

Ecosystem Description

The topography of the NBHMA is characterized by dissected hills of dominantly moderate steepness, alluvial fans and narrow flood plains. About 90 percent of the area is composed of soils high in montmorillonitic clay (National Cooperative Soil Survey of Douglas County, Natural Resource Conservation Service). Deep cracks commonly form in these soils during the dry season then seal up during the wet season with very slow moisture infiltration and permeability. These soils exist in both upland sites (colluvial soils and soils formed over bedrock, primarily basalt) and lowland alluvium. Their depths range from very shallow (<10 inches) over hard or soft bedrock to very deep (>60 inches) (NBHMA FEIS).

The NBHMA can be described in four distinct habitat types (Table 1, Figure 1): Grasslands, Oak Savannah, Hardwood/Conifer forest, Oak Woodlands, and other habitat such as rock outcrops and ash wetlands. The **Grasslands** habitat type is composed primarily of grasses and forbs although it may contain scattered trees and brush patches. The **Oak Savannah** habitat type consists of a grasslands understory with up to 30% of the cover consisting of oak trees scattered or in clumps. The **Oak Woodlands** habitat type is dominated by trees (primarily oaks with scattered conifers). The **Hardwood/Conifer** habitat type is the typical forested setting associated with low elevation valley fringe. The grasslands and oak/savannah woodlands seem to have dominated this landscape in the past as a result of soil types and fire regimes. The young conifer stands are the result of harvesting the older timber stands during the last 100 years and natural seeding to Douglas-fir.

Since BLM acquisition in 1994, no grazing, controlled burning, or logging has occurred. This has resulted in some components of CWTD habitat improving and some habitat components declining, depending on the vegetation type. Some riparian areas have improved while much of the grass and grass/forb areas are declining. Several years of annual growth with no grazing or prescribed fire has resulted in grasslands with thick, dense mats of dead vegetation reducing forage value to CWTD. New annual growth in these areas is much reduced and deer seldom forage on grasslands mixed with old dead vegetation. Undesirable shrubs (hawthorne and blackberry, for example) have expanded and conifers have continued to encroach into hardwood areas making those areas less desirable to CWTD.

Relevant Constraints

There are regulations established for land use planning and management of land, wildlife, vegetation, water, and cultural resources. The following will constrain management activities on the NBHMA:

The Federal Land Policy and Management Act (FLPMA) requires land use plans for all tracts of public land (Sec. 202a). Special priority is also noted by FLPMA (Sec. 202 C. 3) for retaining those values for which the ACEC was established. The Endangered Species Act (ESA) of 1973 requires that essential habitats for special status species be managed consistent with the ESA and current recovery plans. This is reiterated as BLM policy in the Bureau Manual (6840.06 Special Status Species Management).

Oregon Administrative Rules (635-51-048) restricts training dogs or allowing them to run loose during the game bird nesting season. Rule 498.102 of the Hunting, Angling and Wildlife Regulations restricts the use of dogs to hunt or track game mammals or birds. Oregon Revised Statutes (ORS 498.000, 1995, p. 56) prohibit harassing or chasing wildlife. Hunting seasons will occur within time frames, limits, and special permits developed by the ODFW in cooperation with the BLM and USFWS. The Migratory Bird Conservation Act provides for the protection of migratory birds, cooperative investigations, maintenance of refuges, and appropriate enforcement. The Bald Eagle Act of 1940 protects eagles and their habitat.

Noxious weed treatments will be in accordance with the Noxious Weed Act (P.L. 93-629), the Carlson-Foley Act (P.L. 90-583), and the Oregon Administrative Rules (603-052-1200). The 362 acres of O&C lands for timber production will follow the O & C Sustained Yield Act of 1937 and the Northwest Forest Plan.

The Clean Water Act (CWA), Executive Order 11988 (Flood plain Management) and Executive Order 11990 (Protection of Wetlands), require federal agencies to protect wetlands and waterways from point and nonpoint sources of pollution, and to analyze the effects of federal actions on these areas. The objective of the CWA (Section 101a) is to restore and maintain the physical, chemical, and biological integrity of the nation's waters. Implementation of the CWA requires meeting water quality standards (WQS) for point and nonpoint sources of pollution. The EPA and Oregon Department of Environmental Quality (DEQ) nonpoint source management strategy considers Best Management Practices (BMP's) a performance standard for meeting WQS. BMP's are described in Appendix D, Roseburg Record of Decision and are consistent with meeting State WQS. The BLM's role in controlling nonpoint sources of pollution concerning the State strategy (in conjunction with EPA) is identified in a Memorandum of Agreement with DEQ. Executive Order 11990 requires federal agencies to avoid, to the extent possible, adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practicable alternative exists. Executive Order 11988 and Flood plain Management 7221 directs the Agency to 1) "avoid to the extent possible the potential short and long-term adverse impacts..." of any actions it may take in the 100-year flood plain, and 2) "avoid direct or indirect support of flood plain development wherever there is a practicable alternative". Before taking any action, the Agency shall determine whether the proposed action will occur in the flood plain, incorporate the public in the decision making process, notify the public as

early as possible that a contemplated action or proposed action will occur in the critical flood plain area, and assessment of alternatives and implementation of mitigation measures.

The Architectural Barriers Act of 1969, Rehabilitation Act of 1973, and Americans with Disabilities Act (ADA) of 1990 denote the need and expectation of accessible facilities. Site planning has considered access needs and has ensured that routes to and from major developed areas are accessible and incorporate universal design concepts to meet or exceed minimum standards and measurements for accessibility. The use of existing roads/trails and natural surfaces may not meet minimum slope standards of the ADA due to the steep nature of the terrain.

In accordance with the National Historic Preservation Act, ground disturbing projects will be surveyed for archaeological resources.

The Proposed Action specifies construction of water catchments. Permits will need to be obtained from the State of Oregon Water Resource Department (OAR 690-11-014 (4)(f)).

A right-of-way agreement with Lone Rock Timber Company (R-767) encumbers a portion of the north part of the NBHMA.

GOALS

The EIS established two broad goals that will guide all management actions on the NBHMA:

Primary Goal: Ensure that habitat for the CWTD and special status species is managed to maintain species viability over time.

Secondary Goal: Accommodate other uses that are compatible with the primary management goal.

ISSUES

Issues were identified and developed as the result of public meetings, comment letters received and the interdisciplinary process. These issues were reviewed by the ID Team and consolidated into four “key” issues (see EIS, Chap. One).

1. **Columbian white-tailed deer (CWTD) and Special Status Species**
2. **Recreational Use and Facility Development**
3. **Water Quality / Quantity**
4. **Riparian / Wetland Habitat**

HABITAT MANAGEMENT PLAN OBJECTIVES AND PLANNED ACTIONS

This section of the plan presents the objectives that have arisen out of the major issues identified and the management actions that are proposed to resolve those issues.

Issue 1: Columbian white-tailed deer and Special Status Species

Objective #1. *Increase availability, palatability and nutritional level of CWTD forage and browse.*

Management Actions

- **Use of prescribed burning to reduce thatch, rank grasses, shrubs and to reverse conifer encroachment.**

Approximately 4,900 acres of habitat could be subject to burning. This equates to all of the grassland and oak savannah (approximately 1900 acres), all of the oak woodlands (approximately 1170 acres), and approximately half of the hardwood/conifer type (at least 1800 acres). Burning could initially require 800 to 1200 acres to be burned annually to get the NBHMA on to a regular burning rotation. Burning will be done to restore habitat and improve forage for CWTD. Prescribed burning is projected to be at three to five year intervals for grasslands and oak-savannah habitats, three to eight year intervals for the hardwood/conifer type, and five to ten years for the oak woodlands type. Burns will be conducted in association with other management actions to discourage annual grasses and noxious weeds.

Burning will normally be done from August through October. The size of individual prescribed fire units will average between 200-300 acres. Several units could be burned sequentially if no mop-up or escapement problems occur. Control lines will be needed for burning projects. Existing roads and riparian areas are planned for use as control lines. The NBHMA has pre-existing tractor fire trails in place on ridge lines which can be used as control lines during burning. Existing roads will be used for access and as fire lines during burns. New fire trails (up to ten miles) could be constructed for project burns which have no control lines present. Initially, emphasis will be placed on burning areas where roads and existing trails are in place. Newly created fire trails will be waterbarred according to the BMP (Table D-1, RMP, page 136). Burning will be conducted under conditions that result in low intensity fires that will leave plant roots intact. When possible, burns will be timed to discourage annual grasses and increase viability of perennial grasses and forbs. Sensitive soils (sites with slopes over 65% and sparse vegetation) will be avoided. BMP guidelines for water bars and trail construction (RMP, p. 140) will be used to establish and decommission fire trails.

Fire will be applied under the standards set forth in the District Fire Management Plan (1998) and in accordance with the Oregon Smoke Management Plan. A separate, site specific prescribed Burn Plan will be completed for each burn. The Burn Plan will describe ignition techniques and sequences needed to meet the resource objectives. The Burn Plan will also describe measures to reduce smoke emission such as burning when light fuels are dryer allowing more complete combustion. Prior to burning, an on-site smoke permit will be issued by Douglas Forest Protective Association (DFPA) which is a branch of the Oregon Dept. of Forestry (ODF). The State Smoke Management Plan is administered locally by ODF. The permit will establish control and containment strategies as well as provide burning parameters to insure burns during periods of favorable atmospheric conditions that will disperse smoke away from population centers. During periods of extreme fire danger (IFPL level 3 or higher), no burning will be permitted.

- **Use of mowing to reduce thatch, rank grasses and increase opportunity for herbaceous production.**
Approximately 300 acres of grasslands are available for mowing due to gentle slopes and road accessibility to mowing equipment. A given acre could be mowed several times annually.
- **Seeding desirable grasses and forbs after burning to increase the abundance of desirable forage plants.**

Approximately 3,100 acres will be available for seeding. Seeding will generally be done in conjunction with grazing or as a post burn treatment.

- **Use of grazing to increase forage quantity and availability.**

Livestock grazing will be used as a tool to:

- Improve habitat for forbs and succulent grass growth by removing rank vegetation and thatch.
- Increase native and desirable perennial grasses by reducing rank vegetation and reducing competition from annual grasses.
- Maintain forage quantity and availability between burns.
- Treat areas inaccessible to equipment where mowing, plowing, drilling is not practical.

Approximately 4700 acres will be available for grazing. This equates to most of the grasslands and oak savannah (approximately 1700 acres), all of the oak woodlands (approximately 1170 acres) and approximately half of the hardwood/conifer type (at least 1800 acres). A stocking rate of one to one and a half AUM per acre of will be used. The *Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM in the States of Oregon and Washington 1997* will be followed to guide grazing treatment practices.

Kind and Class of Livestock-Grazer selection

Yearling to adult cattle (without calves) would be the preferred class of livestock to be used and would be the most compatible with CWTD. Yearling cattle are more mobile than cows with calves and would utilize uplands more effectively. Deer friendly fences would hold yearling or older cattle.

Initial Stocking Rates and Forage Utilization

Areas that are intensively grazed would have an initial stocking rate of 1.5 animal units per acre. Areas that are extensively grazed would have an initial stocking rate of 1 animal unit per acre. Stocking rates would be adjusted up or down as needed to meet the vegetation management objectives (Objectives 1 and 2). Grazing would remove up to 50% of the annual forage production. This would leave a stubble height of 4 to 6 inches after grazing.

Grazing Units

Grazing Units were delineated by watersheds (Figure 2). Fences used to manage livestock will follow watershed boundaries and tend to be on ridges. Cross fencing may be installed to subdivide the basins and improve vegetation management.

Fencing

Rebuilding or repairing exterior fences are the first priority. These would typically be traditional stock fences of woven wire topped by barbed wire strands. Permanent "Exclusion Area" fences adjacent to grazing treatment areas would be built prior to livestock introduction in adjacent areas. In some cases "Exclusion Area" fences may serve as boundary fences. Interior fences that delineate grazing areas would be made of four strands of wire that facilitate deer and fawn passage. Boundary fences will be permanent. Interior fences that define grazing units are primary fences may be permanent. Primary fences on ridges or in the proximity of roads are less costly to access and maintain. Secondary fences that divide watersheds may be permanent or temporary. Some secondary fences may be used to prevent livestock access to natural springs, riparian areas and/or sites of recent improvements. Fences

will be built as needed. Proposed fences tend to follow current or previous fence lines.

Herding Livestock

Livestock herding may be used as an alternative to fencing. Herding can be used to target specific areas for grazing or to avoid sensitive areas. Herding can reduce the need for interior fencing.

Corrals and Livestock Handling Facilities

Two sites have been identified for these facilities, one on the east side near the main barn and one on the west side approximately 1/4 mile from the west gate. Locations were selected to minimize livestock handling. Permanent construction facilities would be located outside of riparian areas and sensitive areas.

Livestock Distribution

Supplement blocks would be used to improve livestock distribution. They would be placed to increase utilization over the grazing unit and in a specific area.

Water Developments for Livestock

Water developments could be used to distribute cattle over the treatment area. See later discussion on Water Developments (see Objective #12, pg. XX).

Grazing System and Timing

Timing and stocking rates are based on the vegetation manipulation needed to maintain or improve available forage for CWTD, not on the maximum benefit to cattle or livestock operators. All areas treated with grazing would be subject to rest-rotation or deferment. Grazing units would be grazed no more than three times in a five-year period and no areas would be grazed year round. This rest-rotation program will allow plants to recover, vegetative changes to occur, seedings to establish and assessment of the grazing treatment.

Grazing in Conjunction with Other Vegetation Management Techniques

Grazing will be integrated with prescribed fire in order to manage habitat. Grazing will be used to manage vegetation in the periods between burn intervals and will normally be deferred to the next spring following a burn.

Concentrated hoof action could prepare a seed bed or work broadcast seed into the soil. This is especially helpful in areas that are inaccessible to equipment. Use or defer grazing to regulate fuel loads for controlled burning. Use grazing to utilize and reduce vigor of annual grasses and encourage growth and reproduction of perennial native grasses and forbs. Apply fertilizer to invigorate perennial forbs and/or grasses and give them a competitive advantage after cattle are removed.

Exclusion Areas

Three areas totaling approximately 740 acres (Figure 2) would be permanently excluded from grazing. These areas can act as comparison areas for treated acres on similar sites. Susceptible special status plant sites and priority noxious weed sites will be excluded from grazing to prevent additional spread of high priority weeds. Livestock will be excluded from natural springs, sensitive riparian areas and/or sites of recent improvements (forage plots, seedings, stream restoration work, erosion control structures, etc.), if damage to these areas is observed.

- **Fertilization to amend nutrient-deficient soils to increase plant vigor and shift the plant community to more desirable species.**

Up to 4,900 acres will be available for fertilization. Application will be aerially or ground based (tractor, ATV, or by hand). Where aerial application is used, streams and wetlands will be buffered by 100 feet. Ground applications by vehicle will buffer streams and wetlands by 25 feet and hand applications by 10 feet. If treatment is within 0.75 miles of domestic water intake, adjacent land-owners will be notified prior to the date of application. Soil testing will be conducted prior to treatment to determine nutrient availability. Soil will be amended with fertilizer, calcium, etc. as needed to increase forage production.

- **Establish forage plots to extend the period of green forage availability later into summer/fall.**

Establish forage plots (Figure 3) on up to 250 acres by planting protein-rich leguminous forbs and other species preferred by CWTD. Potential species that could be planted include: subclovers, woodrose, alfalfa, fruit trees (apples, pears, plums, etc.), white clover, deerbrush, smallheaded clover, ceanothus, and vetch.

Objective #2. *Manage habitats to retain mature oak, shrub and herbaceous component. Maintain or improve early-seral stage of the hardwood/conifer type and convert marginal habitat into earlier seral stages. Manage residual conifer stands for mature tree attributes.*

Management Actions

- **Manage the Grassland and Oak Savannah and Hardwood/Conifer habitats to retain herbaceous component.**

Oak savannah habitats will be managed for a canopy cover of 30%. Management actions will retain mature oaks and rejuvenate shrubs, perennial grasses and forbs. This will be accomplished by controlled burning, thinning and/or grazing to reduce woody species and seeding to improve habitat for herbaceous vegetation. Treatment will consist of:

- a. Use prescribed fire at intervals of five to seven years in grazed areas, and intervals of three to five years in areas not grazed.
- b. Use grazing, seeding, fertilization, hand or mechanical pulling or cutting to maintain structural characteristics of grassland and oak savannah habitats and remove undesirable plants.
- c. Thin where needed to maintain a canopy of 30% or less in the oak savannah habitat type.

- **Manage Oak Woodlands to retain mature oak, shrub and herbaceous components.** Management actions will retain mature oaks and rejuvenate shrubs, perennial grasses and forbs and retard encroachment by conifers. Seral advancement will be retarded on approximately 1150 acres of oak woodland habitat type by managing for an average tree canopy cover of 50% for hardwoods and 5% or less for conifers. Treatment will consist of:

- a. Controlled burning and grazing to reduce conifer encroachment and stimulate herbaceous growth.

- b. Selective thinning to reduce conifer encroachment and manage canopy closure.
- c. Seeding or planting of native shrubs on up to 1150 acres to increase variety of browse.
- **Maintain or improve early-seral stage of the Hardwood/Conifer type to increase suitability for CWTD.**

Approximately 1,970 acres of the hardwood/conifer vegetation type will be maintained in an existing grass/shrub stage of succession to benefit CWTD (See Figure 1). The land base will be maintained in a ratio of approximately 50% grass/forb habitat interspersed with patches of shrub/tree cover on the remaining 50%. Treatment will consist of:

 - a. Prescribed burning at intervals of three to eight years on approximately 850 acres of habitat. Burn under conditions that will allow a “patchy” type of burn.
 - b. Using manual or mechanical methods to thin shrubs and/or trees to maintain forage/cover ratios.
 - c. Grazing to reduce conifer encroachment and stimulate grass and forb production.
- **Increase habitat by converting Hardwood/Conifer type considered marginal CWTD habitat into more suitable earlier seral stages.**

Set back succession on approximately 960 acres of late seral hardwood/conifer habitat to an earlier seral stage consisting of a mixture of approximately 50% grass/forb habitat and 50% shrub/tree cover. Treatment will consist of:

 - a. Thinning, slashing and burning existing selected marginal habitat areas.
 - b. Planting, seeding, and fertilization to establish forage and cover species in treated area.
 - c. Prescribed burning at three to eight year intervals, grazing and mechanical methods to maintain acreage in a seral stage and habitat mix suitable for CWTD.
- **Manage residual conifer stands for mature tree attributes.**

Residual conifer stands (approximately 180 acres, Figure 4) will be treated to increase conifer growth rates and reduce competition. Treatment will consist of:

 - a. Thinning selected stands to increase growth of desired trees.
 - b. Habitat will be underburned at intervals of five to ten years to reduce fuels.

Objective #3. Control noxious weeds in the NBHMA.

Management Actions

Integrated Pest Management will be used as described in the Northwest Area Noxious Weed Control Program EIS (1985 and supplement 1987) and The Roseburg District Integrated Weed Control Plan and EA (1995) to control infestations of noxious weeds. Priority will be given to infestations along roads, around buildings, at heavily used recreation sites, and where infestations threaten resource values related to key issues. All control methods available to Integrated Pest Management will be used including biological, manual, mechanical (including

prescribed fire), and chemical treatments (Northwest Area Noxious Weed Program EIS, 1985, pp. 6 through 13).

Objective #4. *Protect, manage and conserve existing populations of special status plants.*

Management Actions

Established populations of *Arabis koehleri* var. *koehleri* (shrubby rockcress), *Perideridia erythrorhiza* (red root yampah), *Plagiobothrys hirtus* (popcorn flower), and *Sisyrinchium hitchcockii* (Hitchcock's blue-eyed grass) will be enhanced and expanded. All other special status plants will be maintained.

- Approximately 140 acres of the habitat will be enhanced by increasing numbers of individuals over current levels by 25% in 10 years. Increases will be achieved by planting seed and vegetative material and improving habitat by controlling competing vegetation (grass, forbs, shrubs and trees) and noxious weed infestations. Manual and mechanical techniques including prescribed fire, will be used on competing vegetation.
- An additional population of *Plagiobothrys hirtus* will be introduced into suitable habitat where there are no conflicts with CWTD management. Introduced populations will be established by removing competitive grass, forbs, and shrubs prior to introduction and planting seed and/or vegetative material on approximately five acres in accordance with methods developed by Oregon Department of Agriculture.
- Increase the numbers of individuals in populations of red root yampah and Hitchcock's blue-eyed grass in yampah flats and shrubby rockcress at rockcress point by 25% over the ten year life of the plan. Plant seeds and vegetative material (such as tubers, rhizomes, seedlings) in suitable habitat at a frequency of no less than every other year until 25% increase is achieved.

Issue 2. Recreational Use and Facility Development

Objective #5 *Provide a range of recreational opportunities compatible with the management of CWTD and other Special Status species.*

Management Actions

- **Maintain a network of access roads and trails.**
Twenty three miles of road will be maintained on the NBHMA (Figure 5). Nine miles of road will be decommissioned. Roads in excess of administrative need (49 miles) will be incorporated into the trail system. Motorized vehicles may be used by official personnel on trails for emergency use. Official use of all terrain vehicles (ATV's) is permitted on trails as well as maintained roads year round. Official use will typically consist of relatively light and occasional use for research and management purposes (including law enforcement) primarily by BLM and ODFW personnel. Use of roads and trails by the public for non-motorized recreation such as hiking, equestrian use, primitive camping and mountain biking will be allowed. Cross-country travel will be allowed for non-motorized users. Primitive camping and non-motorized trail use may be seasonally restricted in fawning areas and sensitive areas of Special Status Species (plant and animal). Trails will be maintained as needed. Trails not needed will be allowed to grass over.

Road and trail maintenance will be conducted during dry conditions (typically between May 15 and October 15). Roads and trails will be mowed in high use areas to reduce fire hazard and facilitate use. Road and trail maintenance activities near sensitive areas such as CWTD fawning areas and raptor nest sites will be deferred during specific seasons when Special Status Species may be vulnerable to disturbance. Some trails may be closed due to unacceptable erosion or damage. Approximately one mile of additional trail will be developed to provide better access and disperse public use. New recreational trails will be constructed according to the standards of BLM Handbook H-9114-1 "Trails" (1984). Where roads and trails intersect fence lines, gates will be installed. New fence construction along roads and trails will be set back ten feet where practical. Stream crossings would be provided to accommodate recreation and management needs. Water developments described previously will also be available for equestrian use.

- **Maintain four existing pullout parking areas along County Road 200 for public use.**

One pullout is considered a safety hazard and will be decommissioned. Pullouts will be extended a maximum of 50 feet and graveled to accommodate parking, improve public access, and meet safety concerns with loading and unloading of vehicles and parking on road shoulders (Figure 6).

- **Main Barn Pavilion Development.**

Development will take place on approximately two acres of land presently occupied by the main barn that served the ranch. This barn has been determined as not meeting safety code for public use and will be torn down and disposed of. A group shelter with a cement floor will be constructed on the same site. Parking will be prohibited along the stream bank; parking barriers will be used to protect the stream bank. The parking area will not cut into the hillside. The parking area will be designed to avoid concentrating drainage onto the stream bank, or into the creek. Design features will include outsloping and graveling parking lot to reduce runoff. A double vault toilet will be installed to meet public needs and contain waste. A manure bin will be constructed to contain horse waste in the area. A roof will be built over the bin to prevent water accumulations. The manure bin and vault toilet will be sealed to prevent water contamination by leaching. The toilet will be a minimum of 100 feet from Jackson Creek.

- **West Entrance Development.**

The development will take place on approximately 1.5 acres. A single vault toilet will be established to meet public needs and confine wastes. The vault toilet will be sealed to prevent water contamination by leaching.

- **Doc's Landing Development.**

The development will take place on approximately 1.5 acres. A concrete boat ramp will be constructed to accommodate heavy fire suppression equipment, such as water tankers. It will be available for use by the Glide Rural Fire Department and the Douglas Forest Protection Association in addition to providing recreational river access and other management activities. A single

vault toilet will be located near the parking area to accommodate public needs and contain wastes. The toilet will be sealed to prevent water contamination and placed outside the 100-year flood plain.

Issue 3. Water Quality/Quantity

Objective #6. *Reduce and control mass wasting and sedimentation into streams.*

Management Actions

- **Repair road segments and problem areas that are contributing to stream sedimentation.**

A road inventory (Table 2) has identified road segments with water diversions, dysfunctional drainages, mass wasting, rutting and presence of wet areas. These segments will be repaired as follows:

water diversions	-	Install driveable water bars and outslope road surface.
dysfunctional drainages	-	Install higher capacity culverts, reinforce inlet basins and harden culvert outlets.
mass wasting	-	Construct rip rap buttresses and retaining structures.
rutting	-	Blade, shape and outslope road surfaces.
wet areas	-	Reinforce road subgrade with geofabric and rock.

The road inventory also identified specific problem areas that are contributing to degraded hydrologic conditions. Table 3 and Figure 5 display the actions that will be applied to correct identified road problem areas.

- **Bring existing roads needed for all weather management (2.5 miles) up to RMP standards.**

Standards (RMP, Appendix D; pp. 136-137) include the addition of crushed rock surfacing and installation of drainage features. This will provide all weather access to the Main Barn, Middle Feeder Barn, and Jackson Ranch (Figure 5).

- **Maintain the remaining road system (20.5 miles) as natural surfaced, seasonal access minimal maintenance roads.**

Natural surfaced roads will receive periodic maintenance as needed. Maintenance of naturally surfaced roads will consist of surface blading, installing water control features (ditches, culverts, drain dips, etc.) seeding, mowing and noxious weed control. Outsloping roads, installing frequent cross drains (drain dips, culverts and waterbars) and having natural (vegetated) surfaces reduces the need for frequent maintenance. The following measures will be used to reduce erosion and concentrated run-off associated with roads:

- Constructing driveable, low maintenance drain dips to limit water diversion.
- Stabilizing unstable road cuts and fills.
- Hardening wet areas by using rock aggregate and geofabric.
- Avoiding the use of wet and soft road segments until dry conditions exist.
- Reducing surface erosion by using a grass or gravel surface.
- Providing adequate spacing of drainage features to insure proper drainage.
- Upgrading stream crossings as needed using the 100-year theoretical flood stage as the criteria for design. In-stream culvert placements will be confined to between June 15 and September 15 “to minimize the area of the stream that will be affected by sedimentation during the low flow period” (RMP, p. 142).
- Replacing undersized culverts and repair damaged culverts and down spouts.
- Placing dissipators on outfalls of culverts, where needed, to dissipate water energy and reduce erosion and scouring.

- Seeding cutbanks and fillslopes where erosion and sedimentation problems exist.
- Limiting the use of highway vehicles on unsurfaced roads to dry conditions.

Objective #7. *Restore and maintain water quality for beneficial uses.*

Management Actions

• **Decommission 9 miles of road.**

Decommissioning (Figure 5) would consist of:

- closing the road on a long-term basis, but may be used again in the future;
- preparing the road to avoid future maintenance needs;
- leave the road in an “erosion-resistant” condition by establishing cross-drains, removing fills in stream channels and potentially unstable areas;
- treating exposed soil to reduce sedimentation;
- closing road with a device similar to an earthen barrier (tank trap) or equivalent (Western Oregon Transportation Management Plan 1996)

Decommissioned roads may be reopened temporarily to accommodate fire management (prescribed fire and wildfire) and restoration activities. Approximately 1.5 miles of road, along the southeast boundary of the NBHMA, will be used as fire access and fire control lines when needed for prescribed burning or fire fighting activities.

• **Fencing**

All fish-bearing streams, stream rehabilitation sites, stream-side plantings, and sensitive areas will be fenced off by a minimum of 35 feet from stream bank or site when cattle are present.

• **Streamside buffers**

Streams will be buffered for applications of fertilizer and herbicide spraying. For fertilizer applications, a buffer of 100 feet for aerial, 25 feet for tractor or ATV and 10 feet for hand applications will be maintained along streams. For herbicide application, a minimum, herbicide free buffers of 25 feet will be maintained around all surface water. Projects specifically targeting instream work and riparian zone enhancement will be allowed within buffers.

Objective #8. *Increase base flows of streams to provide perennial flow into the summer.*

Management Actions

• **Wetlands Development**

Eight sites (Figure 7) have been identified for potential development to restore existing wetlands or create water sources. Developments will not exceed five acres per site and will typically be less than two acres. Water sources will be located to maximize water storage potential, allow development of associated shallow water wetlands, restore flows to stream systems, and minimize site impacts from construction. Development will include: construction of earth berm-type water impoundments; use of explosives or backhoe to create water sumps; and development in conjunction with road repairs or upgrades, such as the construction of water sumps. Developments such as this will also provide a source of water for wildfire suppression.

Issue 4: Riparian/Wetland Habitat

The priority of stream rehabilitation will be:

1. Jackson Creek Drainage
2. Chasm Creek Drainage
3. White-tail Drainage

Objective #9. *Rehabilitate and protect fish stocks at risk and their habitat through a reduction of sedimentation and peak flows associated with roads and instream work to repair degraded stream reaches.*

Management Actions

- **Rehabilitate degraded stream reaches and wetlands to return them to a Properly Functioning Condition.**

Rehabilitation will be based on the conditions of stream bank, bank height, and accessibility. The rehabilitation will include: channel widening, resloping stream banks, and planting stream banks with trees. Such use will be limited to the dry season. In-stream work will be accomplished from July 1 to September 15 to minimize the effects of sedimentation on aquatic organisms. Any excess soil material generated from stream rehabilitation work will be hauled to stable locations on the NBHMA. Appropriate BMP's (RMP, p. 141) will be required for all in-stream and riparian work

Rehabilitate stream banks and headcuts by placing structures such as large wood or rock buttresses below the headcuts. Stream banks that are severely downcut will be resloped using backhoes and tractors to provide suitable planting locations for vegetation.

Planting trees along streams will provide large roots in the future to stabilize the stream channels and reduce erosion and sedimentation.

Aggrade stream channels by installing wood (trees and root wads), rock, or other bioengineered structures within the stream channel. Channel widening will be done as appropriate. The rehabilitation will include construction of rock or wooden grade control structures. Placing large wood or rock in the stream channel will add structure and roughness to the channels. This will armor the channel, catch sediment, and result in decreasing the gradient of the channel.

In some drainages, a more passive approach will be taken. In some of the deeply incised channels, natural stream widening would be allowed to occur. As stream banks fail (slough into stream channel) the stream channel widens. This allows room for the stream to meander and rebuild a flood plain. As the stream meanders and rebuilds the flood plain, stream gradient and flow velocity decrease, stream downcutting decreases and sediment is captured on the flood plain. As the flood plain is reestablished, the stream channel is aggraded by sediment being captured in the flood plain.

Reestablish a canopy cover along streams by planting oaks, Oregon ash, cottonwood and white alder.

Objective #10. *Provide fish passage for stream crossings.*

Management Actions

- Provide fish passage for stream crossings when necessary.

Objective #11. Increase water availability in the uplands for CWTB and Special Status Species.

Management Actions

- Provide one source of perennial water for every 320 acres (approximately 20 water sources).

This will be accomplished through development of springs, installation of guzzlers (rainwater collection tanks) and development of wetlands. Selection will be made from a total of 38 potential sites (Figure 7).

1. Approximately 30 spring sites have been identified on the mid to upper slope areas for potential development. Spring development of the selected sites will include:
 - a. Installation of spring boxes or hand constructed features to hold water that will be piped to a trough or other structure outside of the water impoundment area for storage and availability to wildlife, cattle or equestrian use. The development will be fenced, if necessary, to protect the site from trampling by livestock and recreation use.
 - b. Improvement to the existing spring development that furnishes domestic water to the host site and office.
 - c. Development of springs associated with roads in conjunction with road repairs or upgrades. Such developments will be protected from vehicle traffic with a special drainage system designed to allow water to flow under the road (vented road subgrade).
2. Eight potential guzzler sites have been identified on ridge tops around the NBHMA. Guzzlers will provide a source of water to ridge top areas that lack water during the summer months. Installations will be used by wildlife and equestrian users. Guzzlers will be located near existing roads so they can be manually filled during dry summers and used for fire control.
3. Develop at least one water impoundment with associated wetland in each drainage. Select potential off-channel water impoundment sites in each drainage that will maximize water storage potential, allow development of associated shallow water wetlands and enhance potential to restore flows to stream systems. Create off-channel earth berm type water impoundments in selected sites in each drainage. Water impoundments will store water through the dry periods, maintain succulent vegetation, help to maintain or restore summer flows to streams and maintain a source of water for wildlife. If adverse impacts to water impoundment sites or vegetation are occurring due to livestock and recreation use, fence all or a portion of the water development or pipe water away to a trough outside of the water impoundment area.

Objective # 12. Enhance and maintain biological diversity and ecosystem health to contribute to healthy wildlife populations (RMP, p. 37).

Management Actions

- **Provide habitat attributes to enhance and maintain biological diversity.**

In many instances, management for CWTD will enhance or maintain habitats for other Special Status Species (FEIS, Appendix 1) that depend on that common habitat type. For other Special Status Species it is possible to manipulate existing habitats to increase the fitness for those species. Examples include manipulation of selected conifer stands (Figure 4) to encourage structural attributes that may favor animals such as bats or raptors that need large trees for roosting or nesting. Increasing water storage around springs could enhance habitat for red-legged frogs and other amphibians. Conversion of conifer habitats into hardwood cover types could benefit many species of neotropical birds. Older tree/forest attributes would be promoted by snag creation. Brush and slash resulting from management activities would be piled to create cover for wildlife. This would benefit various species such as rodents, reptiles, amphibians and quail.

ADMINISTRATIVE ACTIONS

The following administrative actions could occur with active management:

- Placement of picnic tables and benches
- Construction of a BBQ pit at the Main Barn Pavilion
- Construction of a water line and water tap for horse users at the Main Barn Pavilion.
- Placement of information boards, interpretive signs or panels, kiosks, trail markers and primitive camper registration boxes.
- Placement of signs, fences, or gates to restrict motorized access beyond the parking areas or to gate off day-use areas.
- Construction of blinds at Watchable Wildlife sites.
- Landscaping of day-use areas (planting shrubs, paving parking lots and walk ways).
- Recreational closures or restrictions needed to protect resources values, minimize user conflicts or promote public safety.
- Granting special recreational permits.
- Service and maintenance of recreational facilities (toilets, parking lots, walkways, etc.).
- Placement of nest boxes, raptor perch poles, and bat houses.
- Construction of temporary fence lines.
- Temporary placement of portable corrals and water troughs.

MONITORING

Monitoring of these management actions will be done at appropriate intervals to evaluate if the goals and objectives of this plan are being met. The Monitoring Plan describes the monitoring that will be adhered to for the management of the NBHMA. In addition to monitoring, several studies are either in progress at this time or are proposed. These studies are in cooperation with the Oregon Department of Fish and Wildlife and the Oregon Department of Agriculture.

RESEARCH OPPORTUNITIES ON THE NBHMA

1. Monitoring of Columbian black-tailed deer (CBTD) on NBHMA

With current research on the NBHMA, information has been gathered on CWTD, but little on CBTD. To adequately evaluate the effect management of the NBHMA has on the resident deer population, similar data on habitat use, home range and survival rates of CBTD is needed. In that regard, starting fall 1997, CBTD have been captured, radio-marked and monitored. Research is ongoing.

2. CWTD - CBTD population manipulations

The primary goal for NBHMA is to provide optimal CWTD habitat, which should help increase populations. Thus, depending on the results of the above research, there will be a need to manipulate and monitor the vegetative components and/or the deer populations. For example, results of the above studies may find competition between the deer species and suggest that CBTD are suppressing CWTD populations. To test the suppression, CBTD harvest could be increased on the NBHMA and changes in CWTD populations will be monitored.

3. NBHMA habitat manipulations

Based on the results of the projects listed above, the HMP will manipulate habitat on the NBHMA to benefit CWTD. Manipulations will seek to increase the quality and quantity of preferred habitat. These habitat changes should allow CWTD populations to increase. To test whether or not habitat manipulations have a positive impact, CWTD populations need to be monitored. This will be a long-term project requiring population monitoring, vegetation management and deer-proof fencing (to test treated versus untreated areas). The study will need to be maintained for a minimum of five years.

COST ESTIMATES AND IMPLEMENTATION SCHEDULE

This section outlines the purpose of various projects and their associated costs. Projects are not listed in order of priority and no implementation schedule has been established. Some projects are likely to be funded by outside sources or grants. Cost estimates are based on 1997 prices.

Objective #1. *Increase availability, palatability and nutritional level of CWTD forage and browse.*

Objective #2. *Manage habitats to retain mature oak, shrub and herbaceous component. Maintain or improve early-seral stage of the hardwood/conifer type and convert marginal habitat into earlier seral stages. Manage residual conifer stands for mature tree attributes.*

1. Burning

Controlled fire is a very useful tool in controlling succession, reducing the threat of catastrophic fire, and enhancing forage quality. Fire figures prominently in managing the grassland, oak savannah, oak woodland, and the brush field areas of the NBHMA. Costs are inversely related to the amount of area to be burned at any one time. Burning costs can be broken down into two components -- actual burning costs and the costs of constructing control lines.

- a. Burning costs range from \$8 - 16/acre and include crew costs for ignition, burning, and mop-up. Mop-up costs are the driving factor here; with heavier fuel types requiring more mop-up. A ten-person crew working eight hours will total approximately \$1,600.
- b. The cost of constructing control lines range from \$0.20 to \$1.20 depending upon the methods employed:
 - 1) Handline \$0.60/foot
 - 2) Cat \$1.20/foot with a \$500.00 move-in cost
 - 3) Foam \$0.20/foot

Rehabilitation of the control lines (waterbarring, seeding, mulching) could be accomplished using the fire crew. With control lines in place, an experienced crew could easily burn several thousand acres in a two-three day period.

2. Grazing

The potential exists for partnership arrangements for exchange of service between the BLM and contractors. No cost estimates have been established.

3. Fencing

Remove and replace approximately 9 miles of existing fence along boundaries. Boundary fence consist of woven wire with two courses barbed wire (\$13,200/mile). Remove approximately 17 miles of interior fencing (\$1320/mile). Build interior fencing with "deer-friendly" fence (\$8,000/mile). Up to 23 miles of interior fencing is needed. The amount of interior fencing depends on use of temporary electric fences versus permanent fencing and herding livestock which would preclude the need for fencing.

Remove and replace approximately 9 miles of boundary fence	\$118,800
Brush both sides of boundary fence (annual maintenance)	\$1,100
Remove approximately 17 miles of interior fencing	\$22,440
"Deer-friendly" interior fencing	\$184,000
Electric fencing	\$8,000

4. Fertilization

Estimated cost of \$12 - 15/acre for fertilizer and application. Costs vary by technique, application rates, and target species.

5. Forage Plots

The preferred alternative calls for planting up to 250 acres of dispersed forage plots. Costs can be broken down into two main groups--mechanical contracts and supplies.

a. Mechanical preparation costs average \$140.00 - 200.00/acre (includes cultivation, seeding, and fertilizing).

b. Supplies

Seed and fertilizer costs estimated at \$100 - 125/acre

6. Thinning

Precommercial thinning (PCT) of trees or the suppression of competing brush/undesirable species will be used to accomplish this. Costs for PCT and brushing average \$150.00/ac.

Objective #3. Control noxious weeds in the NBHMA.

Noxious Weed Inventory, Monitoring, and Control

Integrated pest management techniques will be used to initiate eradication of all Oregon List A noxious weeds within one year of discovery. Integrated pest management will be applied to Oregon List B noxious weeds as necessary to control infestations. Mechanical, manual, chemical, and biological methods may be applied to high use areas such as parking lots, roadways, and recreation sites. The introduction or redistribution of biological control agents will be the primary method of control for List B weed control outside of priority control areas. Treatments will be monitored to determine effectiveness. Inventories will be conducted in areas where new infestations of both List A and B weeds are suspected. Cost: \$10,000/year.

Objective #4. Protect, manage and conserve existing populations of special status plants.

1. Special Status Plant Assessments

Both quantitative and qualitative monitoring will be conducted on Special Status Plant locations. Quantitative monitoring will be conducted at Special Status Plant locations where enhancement management has been implemented and where experimental populations have been established. Cost: \$4,000/year.

2. Special Status Plant Enhancement and Establishment

Enhancement management will be conducted on red root yampah habitat to increase the amount of occupied habitat in the Yampah Flats and Whitetail Creek watersheds. Enhancement management will be conducted on Hitchcock's blue-eyed grass habitat to increase the amount of occupied habitat in the Yampah Flats and Chasm Creek watersheds.

At least one experimental population of red root yampah and Hitchcock's blue-eyed grass and two experimental populations of popcorn flower will be established in unoccupied, suitable habitat. Cost: \$12,000/year.

Cost Estimates

Population Enhancement:	\$2,500 per species, \$7,500 total
Population Introduction:	\$12,000
Monitoring:	\$5,000 per year

Objective #5. *Provide a range of recreational opportunities compatible with the management of CWTD and other Special Status Species.*

1. Recreation Facility Cost Estimates

Main barn complex:

Pavilion	\$100,000
Gravel parking area for vehicles & trailers	10,000
Manure bin	1,000
Double vault toilet	25,000
Picnic tables (5)	1,800
Information board	700
Fencing, gate	<u>2,000</u>
	140,500

West entrance:

Gravel parking area for vehicles & trailers	5,000
Single vault toilet	13,000
Information board	1,000
Fencing, gate	<u>2,500</u>
	21,500

Doc's Landing:

Gravel parking area	3,000
Single vault toilet	13,000
Information board	1,000
Concrete boat ramp, rip/rap	<u>125,000</u>
	142,000

<u>Pullout Parking areas along Cty. Road 200:</u>	3,500
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TOTAL \$ 207,500

(1997 dollar estimates, overhead costs not included.)

2. Visual Resources Cost Estimates

The BLM's Visual Resource Management system (VRM) provides a systematic approach to the management of aesthetic resources on public lands. The VRM system provides for inventory of existing scenic quality and assignment of visual resource inventory (VRI) categories based on a combination of scenic values, viewing distance zones, and visual sensitivity. Four visual resource classes have been established to serve two purposes: (1) provide an inventory tool to portray the relative value of existing visual resources, and (2) provide a management tool for portraying visual management objectives. To manage the quality of the NBHMA's visual environment and reduce the visual impacts of development/management activities, a visual resource inventory should be completed within one year of the completion of the EA and Habitat Management Plan.

3. Environmental Education

Costs:

Projected cost estimates for developing and maintaining educational programs around resources available on the management area have no basis for comparison at this time. Projected costs identified in this document are based on estimates of work months needed to initiate preliminary scoping for an educational program. Costs for individual projects will be identified during the initial scoping phase of project initiation. Continuation of educational opportunities will depend on annual funding to maintain or continue programs over time.

- a. Initial scoping, coordination and development of cost estimates for objectives: six work months at \$4,000/wm = \$24,000 for project initiation costs.
- b. Annual costs for coordination and continued development of educational programs (includes field assistance for educators). Estimated at three work months at \$4,000/wm = \$12,000 annual personnel costs.

Total costs for full implementation over time will depend on the type of project, resources necessary to develop, annual resource utilization by institutions and amount of costs that can be offset by use of volunteers or donations. Initiation of an environmental education program on the NBHMA will be dependent on the approved Habitat Management Plan and funding. Continuation of an environmental education program, once initiated, will be dependent upon support and use by the community and adequate funding.

Objective #6. *Reduce and control mass wasting and sedimentation into streams.*

Objective #8. *Increase base flows of streams to provide perennial flow into the summer.*

Objective #11. *Increase water availability in the uplands for CWTB and Special Status Species.*

1. Water Impoundments

Create open water impoundments in lowland areas of the management area. Use excavation in areas of saturation to create potholes. Surface of potholes will be at grade of surrounding landform. Construct berm/dam type water impoundments in areas to collect overland runoff or water directed from road systems. Use cross channel/in channel dams/structures to collect sediment, raise water table, create open water areas.

- a. Pothole development in saturated areas:

Approximate cost assuming access for heavy equipment, multiple excavations in selected areas: Large backhoe or excavator, approximately \$104/hour; 2 dump trucks, plus operators, \$120/hour; and move-in costs, \$600/move. For example, one excavation could equal 20 foot x 20 foot x 6 foot deep = 88 cubic yards of

material removed from the site. Estimated time per pothole after setup will be two hours. Assuming three potholes in the general vicinity per day without additional moves could be done. Total cost would be: \$624/excavator + \$720/dump trucks + move in at \$650. Divided by three potholes in the same vicinity, the cost will be \$665 per pothole. Additional sites will require transport and moving costs to new locations.

b. Instream Impoundments:

Approximate costs for off channel, berm type water impoundments construction. Costs include engineering required at site, clearance, permits, and actual construction. Costs are highly variable due to site differences, project size. Costs are based on estimates furnished by Douglas County Soil Conservation District. Median cost for average size pond, approximately \$40,000. Range \$10,000 -- \$60,000.

2. Seeps & Springs

Develop existing springs/seeps to furnish free water sources. Install collection systems to divert water to storage tanks for dry season availability. Installations could be similar to guzzlers with storage tanks and drinking troughs/fountains suitable for wildlife. Developments will be installed using both hand labor and heavy equipment at suitable sites.

Storage tank cost \$750 -- \$1,600; Springbox, \$250; Miscellaneous hardware, water line, perf pipe, drain rock, \$350; Labor, \$500; Heavy equipment with operator, \$350; Total cost for installation, approximately, \$2,200 -- \$3,050.

3. Water catchment, storage type guzzlers

Guzzler types are dependent on soil depth and access to selected sites. Above ground installations are used in shallow soil areas to reduce the need to use explosives or large heavy equipment for excavation. Installations should be visually non-intrusive. Below ground storage tanks will be used where soil depth is adequate to bury tanks with heavy equipment and access is adequate for materials and equipment. All installations will need to be fire resistant due to potential burning for habitat manipulation/maintenance.

a. Approximate costs for above ground installation, 2,000 gallon + capacity:

Pre-fabricated guzzler, parabolic type: unit cost approximately \$4,000; Labor for installation approximately \$500 (volunteers may be used for installation of this type); Equipment, (backhoe, etc.) approximately \$200/unit, if needed. Total/unit approximately \$4,700.

Component type guzzler: Storage tank cost \$750 to \$1,600; Collection apron, metal supports, approximately \$300; Miscellaneous parts and water line, approximately \$200; Labor for installation, approximately \$600; Equipment use/unit approximately \$350. Total approximate cost, \$2,300 -- \$3,150/installation. (Assuming suitable access to site).

b. Approximate costs for below ground installation, 2,000 gallon + capacity:

Component type guzzler: Storage tank cost \$750 to \$1,600; Collection apron, metal supports, approximately \$300; Miscellaneous parts and water line, approximately \$200; Labor for installation, approximately \$750; Equipment use/unit approximately \$600. Total approximate cost, \$2,600 - \$3,450/installation. (Assuming suitable access to site, suitable soil depth, no use of explosives).

4. Project Maintenance

Maintenance and inspection of various water developments will be required throughout the life of each installation. Costs involved will include work

months required for maintenance and inspection, replacement of components, and potential repair of damaged developments. In the case of guzzlers, inspections and routine maintenance will be required at least two times yearly. With ponds, inspections may be required after each storm event that is significant enough to have an effect on the structure. Work will also be required on each installation prior to habitat burning in order to prevent damage to structures. Cost projections do not anticipate significant damage to installations or potential modifications that may be required in the future.

Anticipated annual costs include: work months, .75 wm's @ \$4,000/ WM; materials and supplies, replacement parts, \$1,250; heavy equipment, \$500. Annual total maintenance costs, approximately \$4,750. Average cost per installation, approximately \$240.

Objective #7. *Restore and maintain water quality for beneficial uses.*

Objective #9. *Provide fish passage for stream crossings.*

Objective #10. *Rehabilitate and protect fish stocks at risk and their habitat through a reduction of sedimentation and peak flows associated with roads and instream work to repair degraded stream reaches.*

1. Rehabilitation of stream segments

Based on the conditions of stream bank, bank height and site accessibility. A segment is assumed to be 500 feet long. Cost of the project is estimated at \$6,000 to \$8,000.

2. Rehabilitation of head cuts

The rehabilitation action will consist of reinforcing with rock buttresses below the head cuts. Cost of stabilization of the headcuts is estimated at \$1,000 to \$1,200 each.

3. Aggrade stream channels

a. *Cross channel installation:* costs are highly variable due to type, site, size of installation and engineering required to design structure(s). Cost based on estimates furnished by Douglas County Soil Conservation District. Range of costs for "hard" installations, \$500 to \$10,000. Small projects such as installation of brush bundles or small sills to capture silt could be accomplished at little cost with volunteer labor and donated materials, (Christmas trees). Cross channel structures will be designed to capture bedload to aggregate streambeds in order to raise water tables, allow vegetation to establish and stabilize streambeds.

b. *Grade Control Structures.* The rehabilitation action will include construction of rock or wood grade control structures. The project costs will depend on site-specific situations, but will probably range between \$500 and \$1,500 each.

Cultural Resources

Public education - Continue use of site 35DO61 for public education. This will take the form of continuing excavations at site 35DO61, using volunteers from the community, as well as professionals. Providing public tours of the excavation in progress is an additional opportunity. The development of an interpretive display at the NBHMA house could complement onsite work. Estimated cost are approximately \$25,000/year to support excavation efforts.

Inventory - Complete a cultural inventory of all management area lands. Estimated time period for completion is approximately five years. Estimated costs are approximately \$6,000/year x 5 years = \$30,000.

Project clearance - Inventory all proposed ground disturbing project sites for cultural resources. Mitigate sites if required. Estimated inventory costs are approximately \$1,000⁴³

year. If need for mitigation arises, costs will depend upon the magnitude of mitigation. No estimates for mitigation costs are available.

Studies

1. CBTD populations on NBHMA

With the current on-going research, data will be available for CWTD, but little on CBTD. To adequately evaluate the role that NBHMA has in the resident deer population similar data on habitat use, home range and survival rates on CWTD is needed. In that regard, starting fall 1997, CBTD will be captured, radio-marked and monitored. The ODFW can provide the radio-collars, capture of the deer, a vehicle and some monitoring, but a technician (or graduate student) devoted to obtaining data is required for efficient use of the resources. Funds to hire the technician would be required.

Cost: \$2,000/month.

2. CWTD - CBTD population manipulations

This study will entail frequent population level monitoring and surveys requiring support for FLIR (or similar) helicopter flights. It will also require regulation changes to increase CBTD harvest. A technician will be required to continue monitoring of the previously marked CWTD and monitor changes in habitat use patterns, survival, and dispersal. A rapid change in CWTD populations should occur upon being "released" from CBTD suppression. Two year study.

Cost:

Graduate student (2 years):	\$30,000
Transmitters (60):	\$18,000
Technician (2 years):	\$48,000
2 Vehicles (2 years):	\$24,000

3. NBHMA habitat manipulations

Cost:

Deer proof fence:	\$8,000/mile
Graduate student:	\$15,000/year
Technician:	\$24,000/year
Vehicle:	\$12,000/year
Vegetation Manipulation:	Vegetation Management Section

PLAN EVALUATION

This plan is written to cover a period of ten years. It will be assessed annually by an interdisciplinary team to determine if objectives are being met and the reason for any objectives not being met. This will be used to determine which actions would continue and which actions would be modified or discontinued. Results of the assessment will be included in the District's planning update newsletter.

Table 1. Vegetation Types on the North Bank Habitat Management Area
 (Calculated by GIS information and proportionally adjusted to add up to the 6,581 acres recorded in county tax records.)

Vegetation	Acres	Percent of Landscape
Hardwood/Conifer	3,413	51.9
Grassland & Improved Pasture	1,208	18.4
Oak Woodlands	1,152	17.5
Oak Savannah	677	10.3
Riparian areas	78	1.2
Wetlands	36	0.5
Rock Outcrops	17	0.2
Total	6,581	100.0

Table 2. Road Segments Needing Repair

Road Segment	Miles
26-5-11.1A	0.5
26-4-8.1B	2.5
26-4-8.2	0.8
26-4-8.0B	3.6
26-5-2.1	0.7
26-5-11.1B	1.7
25-4-32.3	0.1
26-4-8.0	0.7
26-4-8.4B	1.0
26-4-7.0	0.2
Total	11.8

Table 3. Road Problem Areas

Site No.	Problem	Corrective Action
1	Stream Crossing Failure & Stream Diversion	Construct a reinforced, low water ford.
2	Stream Crossing	Rock fill with drainage structure.
3	Stream Crossing	Rock fill with drainage structure.
4	Road Slide Stabilization	Stabilizing the failing road fill with a rip rap buttress.
5	Degraded Stream Crossing	Reinforce the fill with rock buttresses and replacing old culvert.
6	Heavily Gullied Road Segment (200 feet)	Fill gullies with rip rap rock.
7	Heavily Gullied Road Segment (0.7 miles)	Fill gullies with rip rap rock and correct drainage problems.
8	Stream Crossing Erosion	Reinforce the stream crossing with rock buttresses.
9	Fill Failure at Stream Crossing	Reinforce the fill slopes with rock buttresses.
10	Fill Failure in Landslide Area	Reinforce the fill slopes with rock buttresses.

Figure 1

North Bank Habitat Management Area Vegetation



- North Bank Boundary
- T-R
- Streams
- Sections
- Vegetation**
 - Grass Lands
 - Hardwood/Conifer
 - Oak Savannah
 - Oak Woodlands
 - Riparian Vegetation
 - Wetlands Vegetation
 - Rock Outcrops

scale 1:37000
0.5 0 0.5 Miles

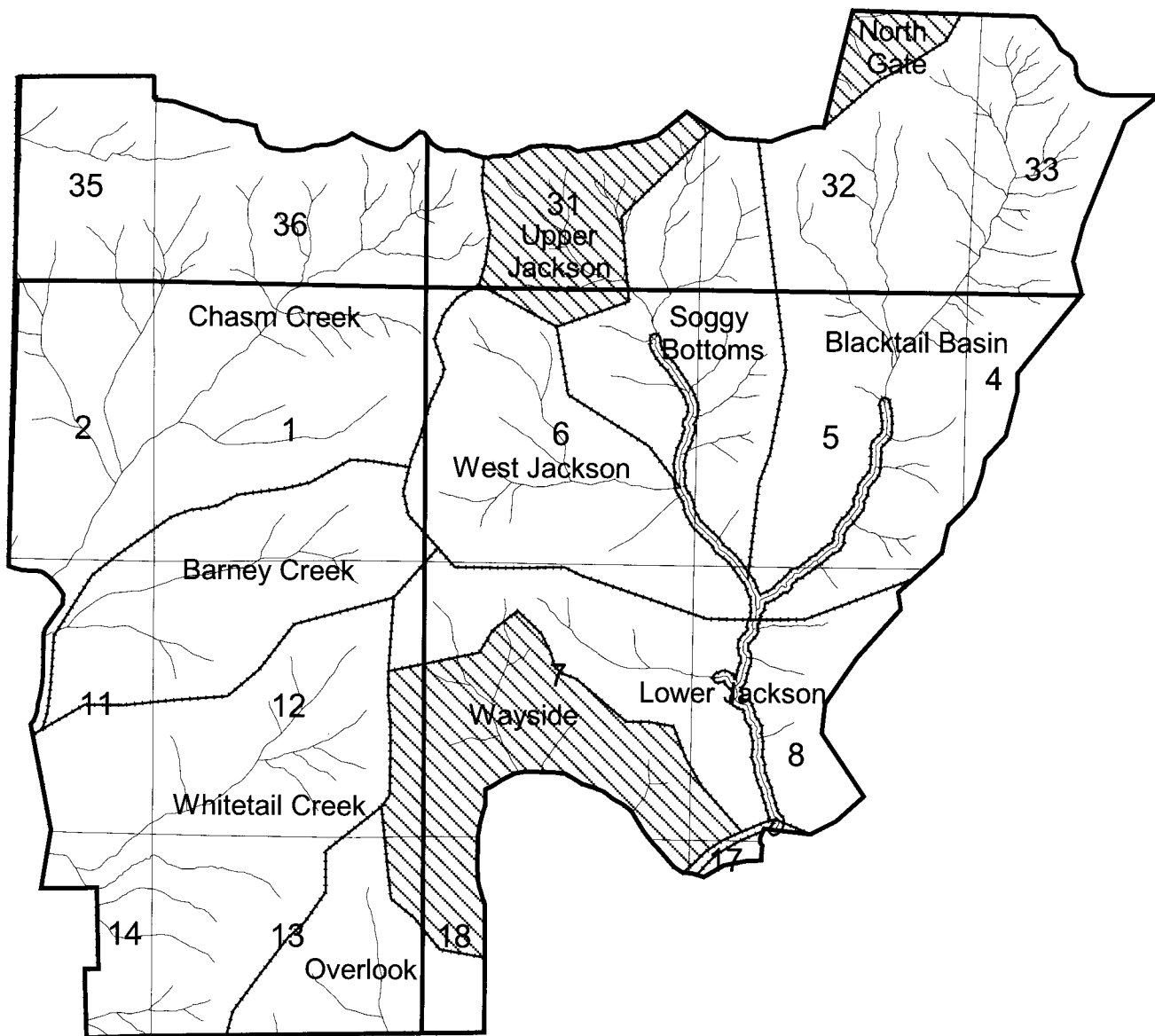
Information used for this map was produced using GIS from the North Bank Watershed Analysis.



Figure 2

North Bank Habitat Management Area

Grazing Exclusion Areas and Potential Grazing Units



- North Bank Boundary
- Exclusion Areas(excluding grazing)
- Proposed Fence Lines
- T-R
- Streams
- Sections

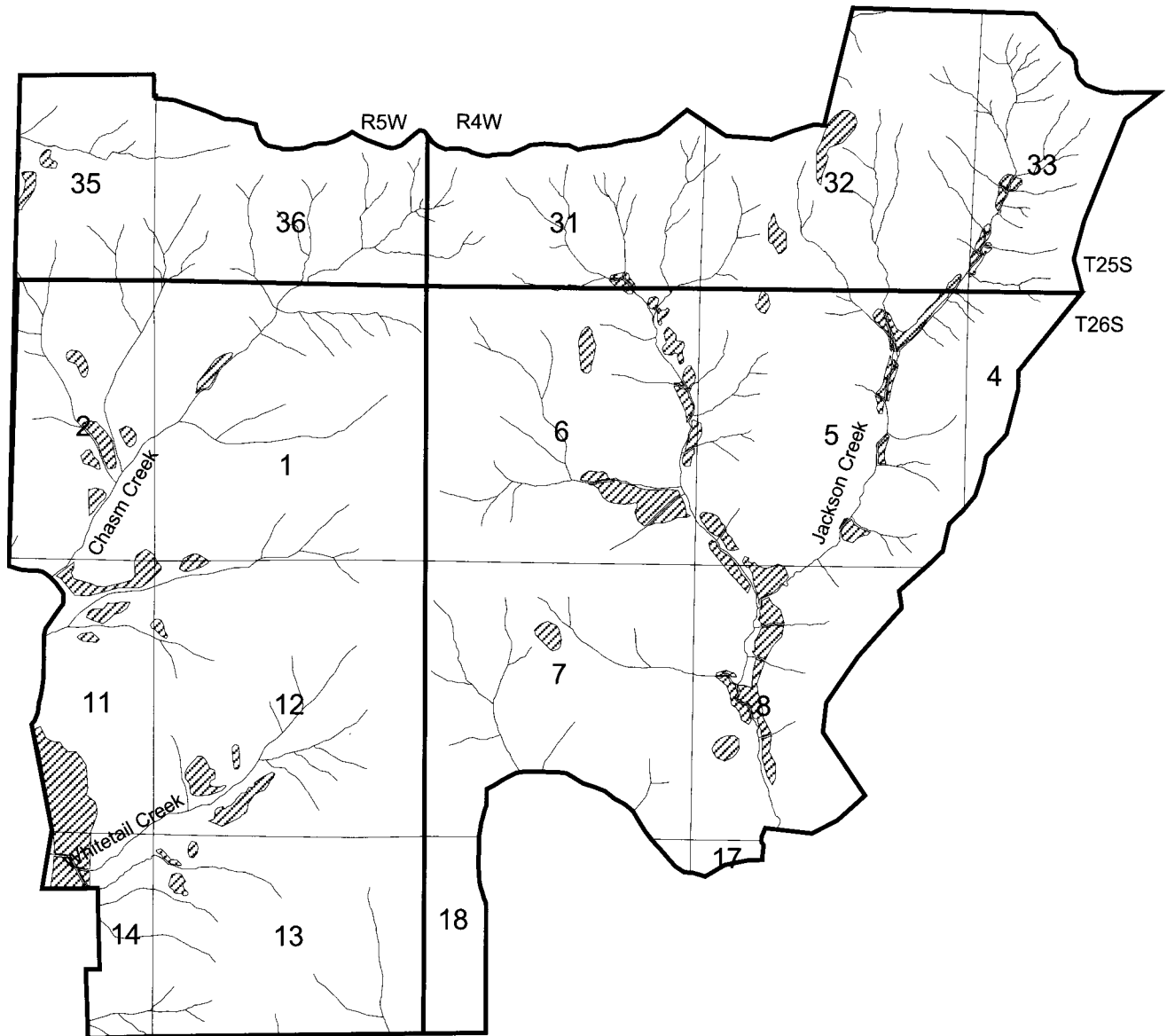
scale 1:37000
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Information used for this map was produced using GIS from the North Bank Watershed Analysis

Figure 3

North Bank Habitat Management Area Potential Areas for Deer Forage Plots



-  North Bank Boundary
-  T-R
-  Streams
-  Sections
-  Deer Forage Plots - 240 Acres

scale 1:37000
0.5 0 0.5 Miles

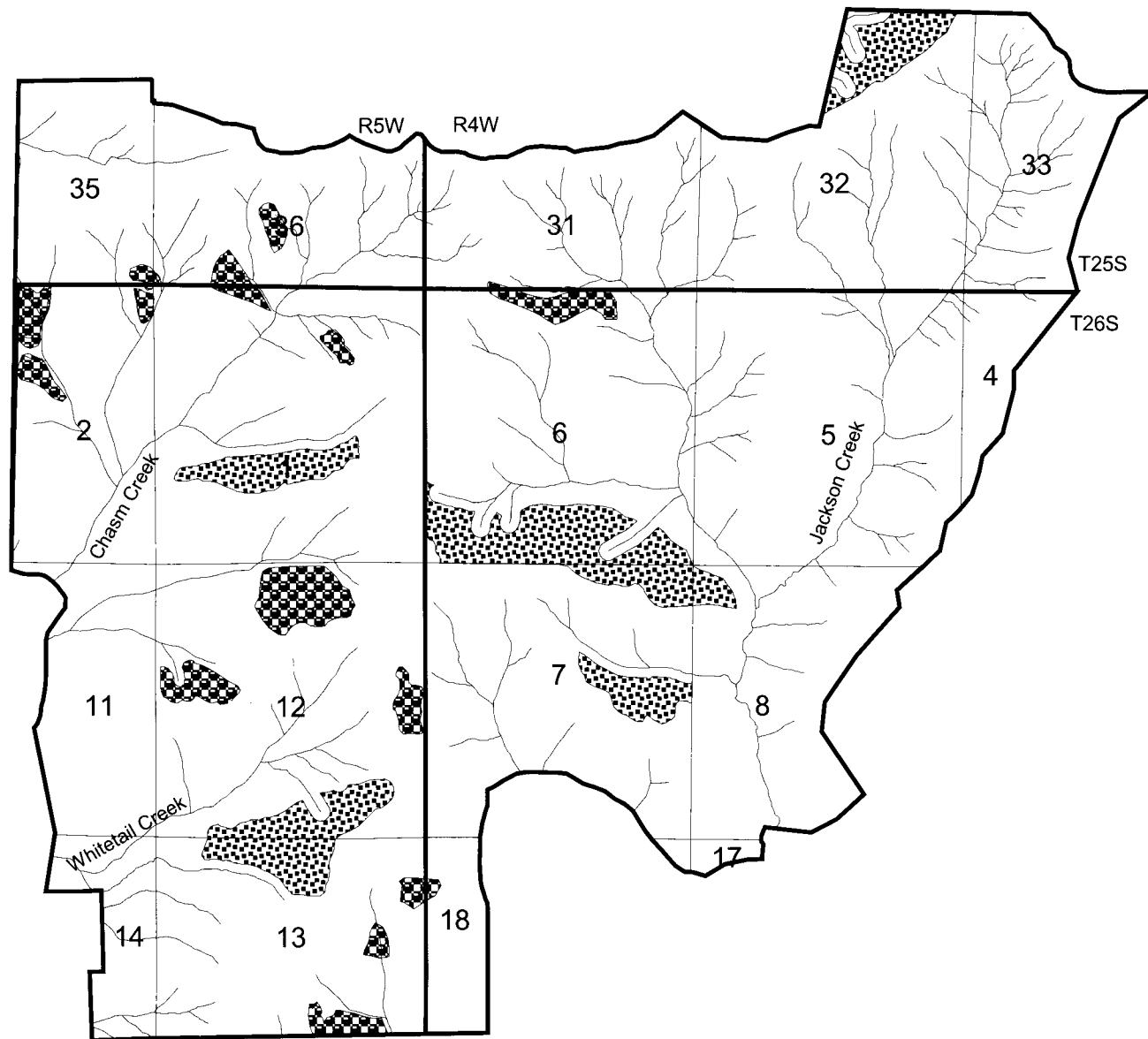
Information used for this map was
produced using GIS from the North
Bank Watershed Analysis



Figure 4

North Bank Habitat Management Area

Timber Management Areas and
Areas Managed for Large Residual Conifers



- North Bank Boundary
- T-R
- Streams
- Sections
- Matrix, Connectivity/Diversity Blocks - 342 Acres
- Residual Conifers - 178 Acres

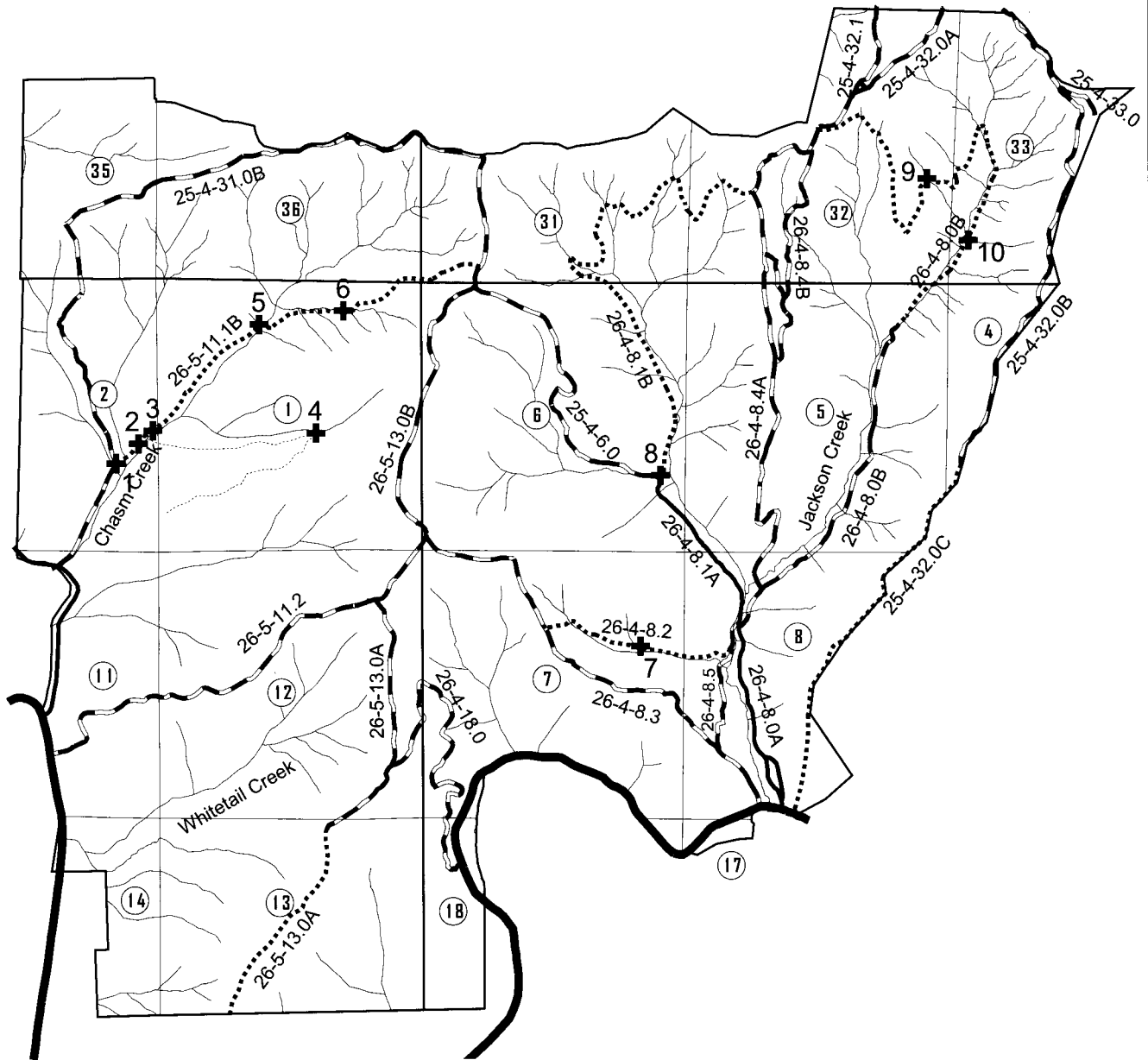
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Information used for this map was
produced using GIS from the North
Bank Watershed Analysis



Figure 5

North Bank Habitat Management Area Roads and Problem Areas Associated with Roads



- ✚ Problem Areas Associated with Roads
- Trails
- Decommission Roads - 9 miles
- Roads - 23 miles
- Gravel Road - 2.4 miles
- County Road
- Streams
- Sections

scale 1:37000
0.5 0 0.5 Miles

Information used for this map was
produced using GIS from the North
Bank Watershed Analysis



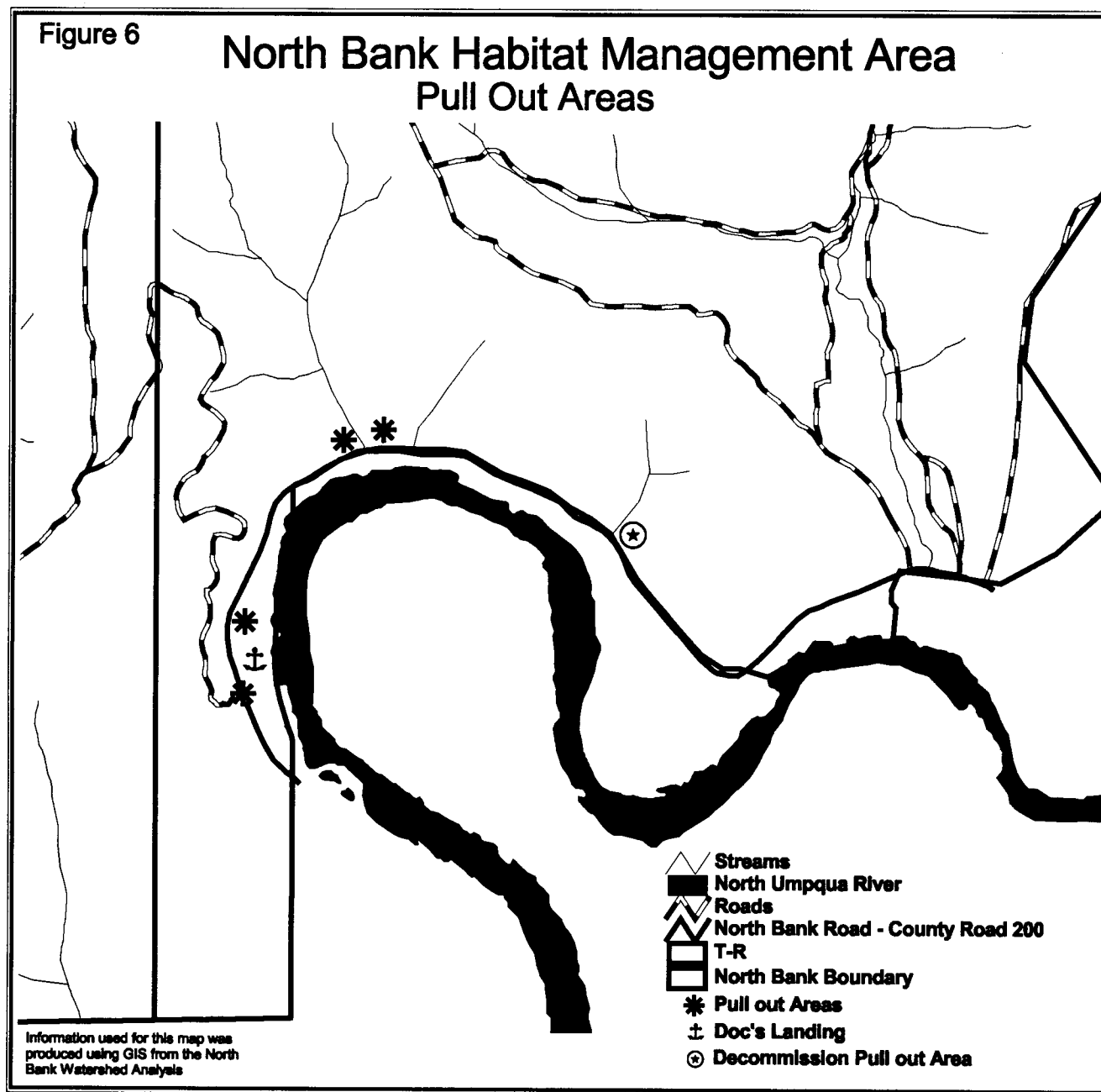
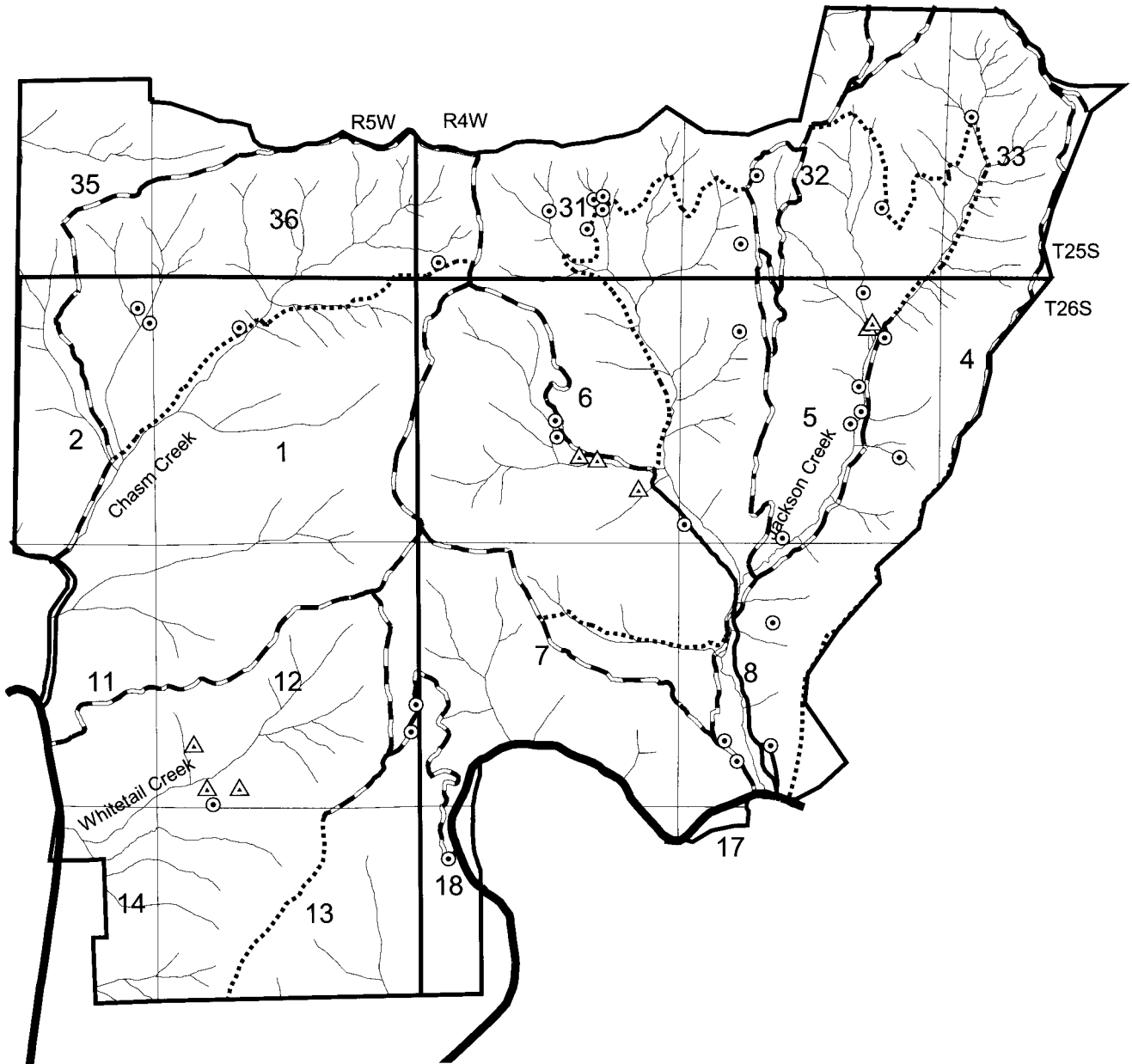


Figure 7

North Bank Habitat Management Area Water Resources: Springs and Wetlands Potential Development



- Springs
- △ Wetlands
- ▬ County Road
- - - Decommission Roads
- ⋯ Gravel Roads
- ▬ Roads
- ▬ North Bank Boundary
- ▬ T-R
- ▬ Streams
- ▬ Sections

scale 1:37000
0.5 0 0.5 Miles

Information used for this map was produced using GIS from the North Bank Watershed Analysis



Monitoring Plan

INTRODUCTION	59
VEGETATION AND TERRESTRIAL HABITAT MONITORING	59
Vegetation and Habitat.....	59
Soils	60
Noxious Weeds	61
Special Status Plants	61
HYDROLOGY AND AQUATIC SYSTEMS MONITORING	61
Fisheries	62
RECREATIONAL USE MONITORING	62
FUTURE ADJUSTMENTS OF MONITORING.....	62
Figure 1	66
References	69

North Bank Habitat Management Area Monitoring Plan

INTRODUCTION

Monitoring of the management actions on the North Bank Habitat Management Area (NBHMA) will be done to evaluate progress in meeting the objectives of the Habitat Management Plan (HMP). Emphasis will be on the manipulation of the vegetative resources to improve forage and habitat for the Columbian white-tailed deer. However, monitoring will also focus heavily on the restoration and recovery of the hydrologic and aquatic resources in the area, the control of noxious weeds, management of special status plant species and recreational uses.

This monitoring plan is organized in three sections to address the various aspects of planned monitoring. These sections include Vegetation and Terrestrial Habitat Monitoring, Hydrology and Aquatic Systems Monitoring, and Recreational Uses Monitoring. The descriptions of planned monitoring are keyed to management objectives in the HMP and, in many cases, management actions within those objectives. Time frames within which monitoring will be conducted are: Baseline monitoring will be conducted to establish a reliable base of information against which long-term data can be compared; Periodic monitoring will normally be conducted on an annual, 3-5 year or 10 year frequency depending on the type of monitoring and the resource(s) involved; and Episodic monitoring would be conducted for some resources after major events (treatment, flood, fire, etc.) occur.

VEGETATION AND TERRESTRIAL HABITAT MONITORING

The vegetation monitoring to be done on the North Bank Habitat Management Area would be in the form of trend studies to determine the effectiveness of management actions and to evaluate progress toward meeting management objectives. The monitoring would be conducted to establish a baseline of information and to then detect changes over time in vegetation type, abundance and quality when management actions are implemented.

Four management objectives to be addressed by this monitoring are:

- (1) Increase quantity, quality, and availability of Columbian white-tailed deer forage and browse (HMP, p. 4).
- (2) Manage habitats to retain mature oak, shrub and herbaceous component. Maintain or improve early seral stage of hardwood/conifer type and convert marginal habitat into earlier stages. Manage residual conifer stands for mature tree attributes (HMP, p.8).
- (3) Control noxious weeds in the NBHMA (HMP, p.10).
- (4) Protect, manage and conserve existing populations of special status plants (HMP, p. 10).

Vegetation and Habitat

Grassland, oak savannah, oak woodland and early seral hardwood/conifer habitat types will be treated with prescribed fire, grazing, mowing, seeding and fertilization. These management actions are expected to reduce thatch, rank grasses, noxious weeds and shrub cover and

curtail the encroachment of conifers. The vegetation monitoring will focus on the effectiveness of these actions and the subsequent establishment of desirable forbs and perennial grasses, the rejuvenation of shrubs and the slowing of the natural succession of the habitat types. Permanent monitoring sites will be established in representative areas based on the major habitat types.

Baseline data on type and quantity of forage species, thatch and noxious weeds will be obtained through the establishment of permanent vegetation sampling plots suitable to the vegetation type and management situation. Close-up photographs will be taken to show vegetation and soil surface characteristics for each plot. These photo plots will be monitored annually to determine if thatch and weeds are being reduced by burning and grazing, if desired deer forage species are becoming established, and to track forage utilization by grazers.

Permanent transects would be used to collect baseline data on shrub, hardwood and conifer habitats. Close-up photographs will be taken to show vegetation and soil surface characteristics for each transect. Management activities will occur over longer cycles of three to eight years in these habitats, so changes in the woody species habitats are expected to occur more slowly than in the grassland and savannah. These transects would be monitored every three to five years to determine if conifer and undesirable woody species establishment is being curtailed, if desirable shrubs are being rejuvenated, and if mature oaks, shrubs and herbaceous components are being retained thus improving deer habitat.

A visual record of baseline vegetation and habitat conditions will be obtained by taking general-view photographs. Comparison of photographs of the same site taken over a period of years will furnish visual evidence of vegetation and soil changes. The number and location of these points will be determined so that they adequately monitor all habitat types and can be re-taken in future years. General-view photographs taken annually in late winter or early spring will document if and when thatch becomes a concern again in a treatment area. It is expected that the frequency of the burn cycle, integrated with grazing, will prevent thatch from becoming a hindrance to the growth of preferred deer forage species. Annual monitoring of these photo points will also document the effectiveness of burning and grazing in reducing shrubs over an area and the encroachment of conifers as well as being a check on the timing for re-treatment. General-view photos will also be used to document the location and general habitat conditions where vegetation sampling plots and transects are established.

These monitoring methods are commonly recommended for woodland and rangeland monitoring to evaluate changes in vegetation characteristics such as composition, production, density, cover and frequency (USDI, 1985). However, if these methods, over time, do not provide the information needed to detect the effect of management activities in manipulating the vegetation, they may be adjusted or replaced.

It is expected that meaningful and interpretable changes in thatch, conifer encroachment, shrubs and other vegetative conditions would occur over a five to ten year time frame. The monitoring described above are expected to detect those changes. If monitoring indicates that management activities are not producing the desired results of increasing deer forage and browse as well as enhancing and increasing deer habitat, then a reassessment of these actions would be warranted.

Soils

Monitoring of soils also addresses the management objectives of increasing deer forage and browse and enhancing deer habitat. The management actions of burning, grazing and mowing to increase forage have the potential to impact soil conditions through erosion and compaction. Initial monitoring will occur over a wide range of site conditions to establish baseline data. The focus thereafter will narrow to episodic sampling of the higher risk sites and sites where substantial erosion problems are found. Random transects, in treated areas, will be monitored to determine the amount of erosion and compaction generated from

burning and grazing. Random transects to monitor erosion will be done during and after the wet season following burning and grazing. Random transects to monitor compaction will be initiated if substantial negative changes in vegetative composition and cover or substantial increased runoff and erosion suggest a possible compaction problem in grazed or mowed areas.

Average yearly soil erosion losses exceeding “T” value thresholds in the long term, over several burning and grazing cycles, would indicate that a reassessment of management actions would be warranted. If monitoring results indicate the occurrence of widespread moderate to heavy compaction that persists through rest periods, then a reassessment of management actions would again be warranted.

Noxious Weeds

Specific monitoring of noxious weed populations on NBHMA will be conducted according to the Roseburg District Resource Management Plan which requires a 20% sampling of the district’s noxious weed treatment sites. Monitoring would include:

- Pre and post treatment surveys;

- Pre and post treatment water samples when herbicide application is near water sources;

- Surveys of biological control agents’ release and establishment.

Noxious weeds would also be monitored through the vegetative transects and photo plots used to monitor forage species and thatch as described above.

Special Status Plants

Special status plant species populations that have been expanded on the NBHMA will be monitored annually using randomly placed plots or by comprehensive census. Monitoring will focus on detecting a 25% change in population numbers over a ten-year period. If a population decline is detected through monitoring, then management actions within the special status plant species habitat areas will be reassessed.

HYDROLOGY AND AQUATIC SYSTEMS MONITORING

The North Bank FEIS describes most of the streams as degraded or not in a proper functioning condition, with a few selected reaches in a more advanced stage of recovery (USDI, 2000, p. 75). Due to changes in stream-forming processes and loss of riparian vegetation, many stream reaches are in a condition similar to that shown in Figure 1 as State B and C. It is expected to take decades for stream channels to evolve to State E or F and a range of flows and sediment transport will occur during this process. Hydrology monitoring will establish baseline conditions, evaluate changes over time in stream channel conditions and riparian vegetation, and evaluate the affects of specific management actions versus natural variability in the stream system.

The management objectives to be addressed by this monitoring are:

- (1) Reduce and control mass wasting and sedimentation into streams (HMP, p.12);
- (2) Restore and maintain water quality (HMP, p.13);
- (3) Increase base flows of streams to provide perennial flow into the summer (HMP, p.14);
- (4) Rehabilitate and protect fish stocks and their habitat through reduction of sedimentation and peak flows (HMP, p.14).

The management actions associated with the above objectives include in-stream and riparian restoration, headcut stabilization, road repair, grazing and burning. Water quality and riparian and stream channel conditions will be monitored as restoration and management activities occur. The frequency and types of monitoring activities are depicted in Table 1.

Photo points will be established at restoration and stream channel cross section sites prior to implementation of restoration activities. Photo points will provide a visual record of existing and changing stream channel conditions. These points will be monitored to track the effectiveness of in-stream grade control structures, in-stream large woody debris placements, and streambank pull-back in improving channel stability and reducing bank erosion. Photos will also be a visual record of change in riparian vegetation over time.

A continuously recording stream gage and two rain gages are installed on Jackson Creek to monitor streamflow and precipitation, respectively (Figure 2). This monitoring will be used:

- (1) in developing rainfall and runoff relationships for erosional effects on water quality,
- (2) in developing stage - discharge relationships,
- (3) in determining design (bankfull) discharge for in-stream projects,
- (4) to track change in base and peak flows over time.

Stream channel cross section sites will be established in the areas shown on Figure 2 and data on bank stability, embeddedness, particle size, bankfull width and depth, longitudinal profile, and degree of entrenchment will be collected. Stream channel cross section sites will also be established in the headcuts shown in Figure 2. The methods for collecting bank stability, embeddedness and particle size information are described in more detail below.

The method of monitoring bank stability is referred to as Bank Erosion Potential (Rosgen, 1996). Bank stability would be measured by inserting metal rods (at 90°) into the stream bank to measure potential changes in bank erosion over time (Figure 3). Another metal rod and scour chains would be inserted into the streambed at the same location to determine changes in bed elevation or rate of aggradation/degradation. A loss of stream bank or degradation of the streambed that exceeds 1 foot/year during small storm events (1.5 - 5 year) would warrant a reassessment of in-stream restoration locations. During larger storm events (> 5 year event), stream banks are expected to naturally collapse due to greater stream power associated with higher flows. Stream widening is also expected as a range of flows move the eroded sediment through the watershed.

Embeddedness measures the extent to which gravels are embedded or buried by fine sediment. It is an indicator of the quality of over-wintering and spawning salmonid habitat. Chapman and McCloed (1987) noted when embeddedness exceeds 65-75% aquatic insect densities decrease. Embeddedness surveys would be conducted in conjunction with cross sections located along fish-bearing stream reaches (Figure 2). If embeddedness surveys exceed 65%, a reassessment is warranted.

Natural stream widening and in-channel management actions have the potential of generating fine particle size bed material. This could affect the suitability of aquatic habitat for juvenile and adult fish and macroinvertebrates. Pebble counts would be monitored at three sites on fish bearing reaches of Jackson Creek where gravels are present. A decrease in mean particle size would signal the need to verify (with cross section and longitudinal profile data) if the decline in particle size would warrant a reassessment of management actions.

Water quality monitoring for sediment will be done at pre- and post-restoration projects. Water quality sampling will be done during herbicide and fertilizer applications. Stream temperature monitoring is not proposed at this time because most streams are dry during the summer months and perennial reaches have interrupted flow. If baseflows can be re-established then temperature would be monitored in the future.

Riparian vegetation will be monitored at the cross section sites and other points along the channel using the greenline and woody regeneration methods and vegetation cross sections (Winward 2000). Establishment of planted and natural vegetation will increase bank stability and reduce sediment delivery into the streams. Riparian vegetation will be monitored during grazing and prescribed burning to ensure the retention of desirable forage and browse species. Aerial photos or satellite imagery will also be used to track the development woody vegetation along streams.

Stream channel and riparian conditions are expected to improve over time moving from State B and C towards E and F as depicted in Figure 1. Degraded streams will widen, build an internal floodplain, and riparian vegetation will become established. Streambanks will stabilize and sediment input to the system will decrease. Baseflows and the water storage capacity of the stream systems will increase. The riparian overstory will provide bank stability, cool stream temperatures, filter nutrients and improve subsurface flows.

Fisheries

Monitoring of fisheries populations is not proposed at this time. The National Marine Fisheries Service has not authorized the BLM to sample fish populations using electrofishing or seining to determine baseline population data. Population estimates using less effective techniques would not give an accurate measurement of the baseline population.

Fish populations are expected to improve as summer streamflows are increased. Streamflow monitoring is currently on-going in Jackson Creek. Factors affecting fish habitat are being monitored as described in the hydrology section. These factors include embeddedness, pebble counts, streamflow and riparian vegetation.

RECREATIONAL USE MONITORING

Visitor logs will be placed to monitor recreational use. If, over time, monitoring indicates a decline in deer populations even though habitat is improving, then a reassessment of recreational use, especially during the fawning season, would be warranted. If monitoring indicates a degradation of trails due to overuse and leading to erosion, then a reassessment of recreational use would be made to avoid a decline in water quality.

FUTURE ADJUSTMENTS OF MONITORING

Adaptive management in the NBHMA will be based on monitoring results and the degree to which management objectives are being met. If monitoring techniques do not provide the information needed to assess trends, they may be adjusted or replaced. In the future, as management of the NBHMA is shown to be clearly accomplishing the management objectives, the intensity and frequency of monitoring may be reduced or replaced with more extensive methodologies. However, if at any time, trends appear to be reversing or there were to be an occurrence of some major event, BLM would revert back to a higher intensity.

Table 1. Monitoring parameters, methods and frequencies for the NBHMA.

Frequency of Monitoring/ Parameter	Baseline	Annual	3 - 5 Year	10 Year	Episodic or Significant Event
CWTD forage quantity/quality	Permanent trend plots in representative sites by habitat type; study plot photo point; general view photo plot.	Study plot photo point. General view photo plot.	Permanent trend plots in representative sites by habitat type.		
Soils	Soil compaction and erosion loss at permanent trend plots in representative sites by habitat type.				Soil compaction after grazing, mowing, etc.; erosion loss after prescribed fire.
Habitat maintenance/ seral stage conversion	Permanent trend plots in representative sites by habitat type; study plot photo point; general view photo plot.	Study plot photo point. General view photo plot.	Permanent trend plots in representative sites by habitat type.		
Grazing		Livestock numbers, location, timing and duration.			
Stubble height		100 point transect within grazed areas			
Noxious weeds	Permanent trend plots in representative sites by habitat type; study plot photo point; general view photo plot.	Study plot photo point. General view photo plot.	Permanent trend plots in representative sites by habitat type.		Pre- and post-treatment for prescribed fire and herbicide application.
Noxious weed biological control agents			Surveys of biological control agents at release sites.		Surveys of biological control agents at release sites after prescribed fire.

Frequency of Monitoring/ Parameter	Baseline	Annual	3 - 5 Year	10 Year	Episodic or Significant Event
Special status plant species	Random sample or population census at treated sites	Annual or biennial random sample or population census at treated sites			
Riparian vegetation	At key sites establish photo points, green line transects, woody regeneration transects and cross channel transects.	General view photo plot.	Green line transects, woody regeneration transects.	Cross channel transects, Landsat/aerial photos.	
Channel	Channel cross section, ODFW stream surveys, bank pins, embeddedness surveys, pebble counts, longitudinal profiles and photo points.	General view photo plot.	Channel cross section, bank pins, embeddedness surveys, pebble counts, longitudinal profiles and photo points.		Channel cross section, ODFW stream surveys, bank pins, longitudinal profiles and photo points after significant flow events.
Headcuts	Channel cross section or total station	General view photo plot.			Channel cross section or total station after significant flow events.
Water quality	gaging station to monitor temperature, flow and precipitation	gaging station to monitor temperature, flow and precipitation			Pre and post treatment sampling when herbicide or fertilizer application is near water sources

Figure 1 An example of channel evolution in an alluvial stream.

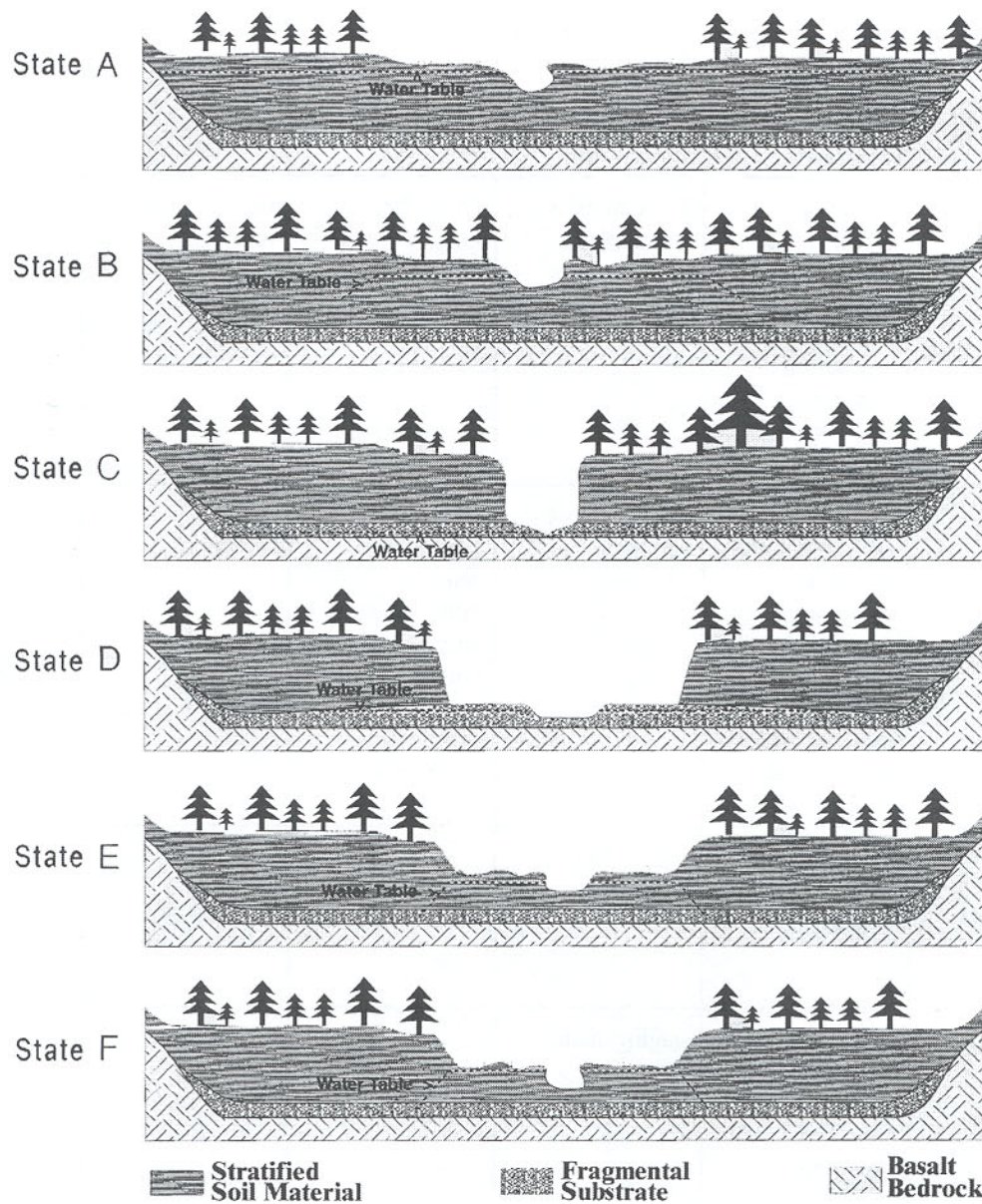
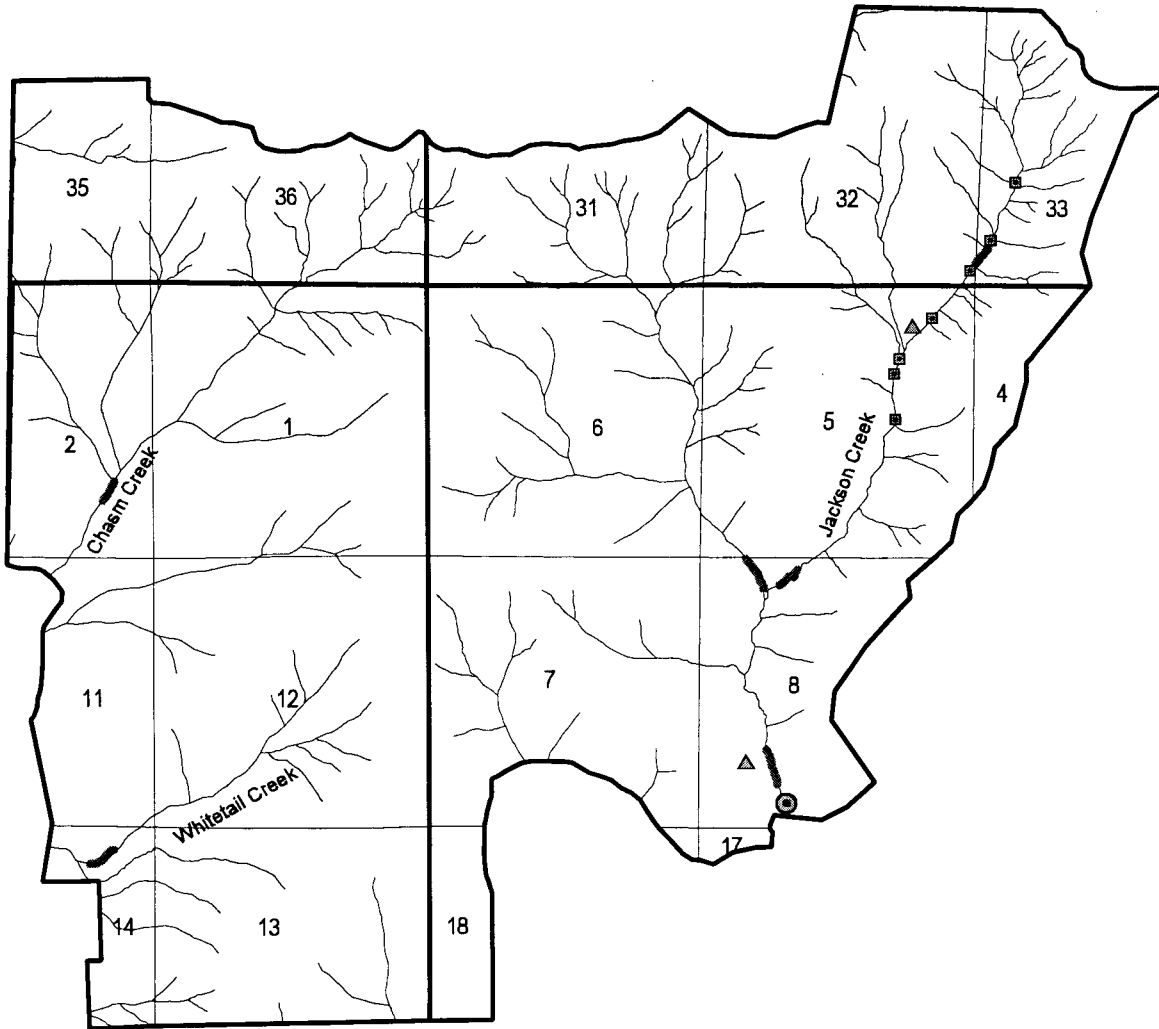


Figure 2

North Bank Habitat Management Area Riparian and Aquatic Monitoring



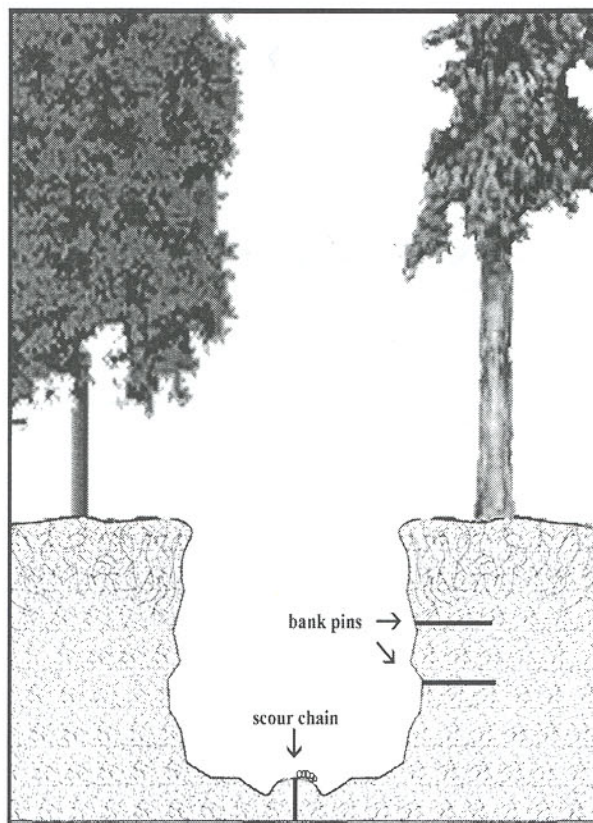
- ▣ Headcut Stabilization Sites
- ⊙ Streamflow Monitoring
- △ Precipitation
- Stream Channel Cross Sections and Greenline Surveys
- ▬ North Bank Boundary
- ▬ Streams
- ▬ T-R
- ▬ Sections

scale 1:37000
0.5 0 0.5 Miles

Information used for this map was
produced using GIS from the North
Bank Watershed Analysis



Figure 3 Example of bank pins and scour chain placement to measure bank stability.



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